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OF
MATERIA MEDICA
FOR NURSES

INCLUDING THERAPEUTICS AND TOXICOLOGY

BY

GEORGE P. PAUL, M.D., C.P.H. (Harvard)

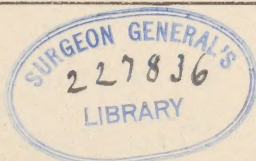
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no 2

TO THE LATE

EVERARD D. JERBUSEN, M.D.

SURGEON-IN-CHIEF, SAMARITAN HOSPITAL, TROY, N. Y. FOUNDER OF
THE NEW YORK STATE MEDICAL ASSOCIATION AND, LATER, ITS
PRESIDENT, SECRETARY, AND TREASURER; SOMETIME
VICE-PRESIDENT OF THE AMERICAN
MEDICAL ASSOCIATION

IN ADMIRATION OF
HIS GREAT TALENTS AND IN REMEMBRANCE OF
MANY ACTS OF KINDNESS SHOWN TO THE AUTHOR
THIS VOLUME
IS GRATEFULLY INSCRIBED

PREFACE TO THE THIRD EDITION

THE author undertakes the revision for the third edition of this volume with great pleasure. He feels that the necessity of a new edition signals the success of the former editions. If the present may prove as helpful to the nursing profession as the past printings, the author will reflect that his labor has not been in vain.

The whole text has been reviewed and alterations made as required. Considerable new material has been added. The drug strengths have been corrected to conform with the changes in the last United States Pharmacopœia.

G. P. P.

ROUND LAKE, NEW YORK,
July, 1917.

PREFACE

IN the preparation and compilation of a book on this subject for the nurse many difficulties are encountered as to the knowledge to be incorporated in the text and that which should be omitted.

The author has essayed to use only such material as will be of aid to the reader, and has arranged the text in such a manner as he thinks will best meet the demands of the nurse.

The subject matter is arranged in six parts. Part I. consists of General Considerations, which will be found of great importance before beginning the study of the individual drugs. To Part II. special attention is directed. The drugs of this section are those of a recognized value. They are arranged alphabetically for convenience and, as the author believes, the proper way, as it is impossible to properly classify drugs according to their action, as the majority of drugs have several equally important actions. The physiologic action of the drug is arranged according to the action of the drug and not the organ acted upon, thus, with a glance, the full action of the drug may be seen. Another characteristic of the text is the section on Pre-toxic Signs or the warnings of the full action or the beginning toxic effects of the drug, which, if heeded, may prevent many cases of drug poisoning. It is

necessary that the nurse should know these signs. Under Administration, many useful points as to when and how drugs should be exhibited are given. Part III. includes drugs of minor importance, which, although not used as frequently as those discussed in Part II., are nevertheless worthy of consideration. Part IV. contains the newer preparations much employed by some physicians. Simple mixtures and combinations are not given place, only those of definite chemic union are considered. Part V. relates to practical therapeutic procedures, which will readily be seen to be of prime importance to the nurse. Part VI. includes tables of the percentage strengths of the official drug preparations; of common synonyms; of relative weights and measures.

In conclusion, the author wishes to state that he has been very painstaking in order that he might present this book to the nurse as a concise, accurate, and practical work, and that it might form a valuable and essential part of her equipment.

G. P. P.

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PART I

GENERAL CONSIDERATIONS

DEFINITIONS

Materia Medica.—The science that treats of the source, preparation, and properties of agents used as medicines.

Therapeutics.—The science which treats of the application of remedial agents in the treatment of diseased conditions.

Toxicology.—The science which treats of poisons: their nature, detection, effects, and the prevention of their ill effects.

Pharmacopeia.—An authority on the strength, purity, selection, and preparation of medicinal agents.

DRUG CONSTITUENTS

Alkaloid.—A nitrogenous vegetable base, as a rule representing the active principle of a drug. They are generally insoluble in water, but soluble to varying extents in alcohol, ether, chloroform, and benzin. They form salts with acids which are generally soluble in water. The Latin termination of the name is *ina* and the English *in*; *e. g.*, Morphina—Morphin.

Amaroid.—A bitter vegetable principle.

Glucosid.—A vegetable principle composed of glucose and some other substance. The Latin termination is *inum* and the English *in*; *e. g.*, Digitalinum—Digitalin.

Stearopten.—A crystallized hydrocarbon deposited from volatile oils; *e. g.*, Camphor and Menthol.

DRUG PREPARATIONS

The names of the various preparations are arranged as follows, first is the English name, then the Latin name, and then the Latin genitive form, which is the one most used in prescription writing :

Cerate. *Ceratum.* *Cerati.*—A preparation for external use whose base is wax, as *Ceratum Camphoræ* or *Camphor Cerate*.

Decoction. *Decoctum.* *Decocti.*—A liquid preparation of a drug obtained by boiling the drug in water and then straining it, as *Decoctum Taraxaci* or *Decoction of Dandelion*.

Elixir. *Elixir.* *Elixir.*—A liquid preparation which is really a syrup containing much alcohol, as *Elixir Phosphori* or *Elixir of Phosphorus*.

Emulsion. *Emulsum.* *Emulsi.*—A liquid preparation in which an oily substance is held suspended in water by gum acacia, yolk of egg, or other agent, as *Emulsum Olei Morrhuæ* or *Emulsion of Cod-liver Oil*.

Extract. *Extractum.* *Extracti.*—A solid preparation of a drug obtained by evaporating a solution of the drug, as *Extractum Opii* or *Extract of Opium*.

Fluidextract. *Fluidextractum.* *Fluidextracti.*—A liquid preparation of a drug, one minim of which is

equivalent to one grain of the drug, as *Fluidextractum Aconiti* or *Fluidextract of Aconite*.

Glycerite. *Glyceritum.* *Glyceriti*.—A solution of a drug in glycerin, as *Glyceritum Amyli* or *Glycerite of Starch*.

Infusion. *Infusum.* *Infusi*.—An aqueous solution of a drug obtained by pouring boiling water on the drug and then allowing it to cool and strain, as *Infusum Digitalis* or *Infusion of Digitalis*.

Liniment. *Linimentum.* *Linimenti*.—A preparation for external use, consisting of strong drugs in an oily base, as *Linimentum Belladonnæ* or *Belladonna Liniment*.

Mixture. *Mistura.* *Misturæ*.—A preparation in which a drug is held suspended in water by some viscid substance, as *Mistura Cretæ* or *Chalk Mixture*.

Mucilage. *Mucilago.* *Mucilaginis*.—A watery solution of a gum, as *Mucilago Acaciæ* or *Mucilage of Acacia*.

Ointment. *Unguentum.* *Unguenti*.—A preparation of a drug incorporated with a fatty base and having a semi-solid consistence, as *Unguentum Iodi* or *Iodin Ointment*.

Oleate. *Oleatum.* *Oleati*.—A solution of a drug in oleic acid, as *Oleatum Hydrargyri* or *Mercury Oleate*.

Plaster. *Emplastrum.* *Emplastri*.—A preparation in which the drug is incorporated with some adhesive substance as resin, as *Emplastrum Belladonnæ* or *Belladonna Plaster*.

Powder. *Pulvis.* *Pulveris*.—A finely powdered drug, as *Pulvis Opii* or *Powder of Opium*.

Solution. *Liquor.* *Liquoris*.—A watery solution

of non-volatile substances, as *Liquor Ferri Chloridi* or *Solution of Iron Chlorid*.

Spirit. *Spiritus.* *Spiritus*.—A solution of a volatile substance in alcohol, as *Spiritus Ammoniaë* or *Spirit of Ammonia*.

Suppositories. *Suppositoria.* *Suppositorium*.—Preparations whose base is cocoa butter, as *Suppositoria Glycerini* or *Glycerin Suppositories*.

Syrup. *Syrupus.* *Syrupi*.—A preparation of a drug in a concentrated solution of sugar, as *Syrupus Rhei* or *Syrup of Rhubarb*.

Tincture. *Tinctura.* *Tincturaë*.—An alcoholic solution of a non-volatile substance, as *Tinctura Nucis Vomicaë* or *Tincture of Nux Vomica*.

Vinegar. *Acetum.* *Aceti*.—A solution of a drug in dilute acetic acid, as *Acetum Scillaë* or *Vinegar of Squill*.

Water. *Aqua.* *Aquaë*.—A solution of a volatile substance in water, as *Aqua Chloroformi* or *Chloroform-water*.

Wine. *Vinum.* *Vini*.—A solution of a drug in white wine, as *Vinum Opii* or *Wine of Opium*.

DRUG ACTIONS

Alterative.—A drug which modifies metabolism and overcomes morbid processes.

Analgesic.—A drug which when given internally relieves pain. Also known as a general anodyne.

Acetanilid	Antipyrin	Atropin
Bromids	Caffein	Camphor Monobromate
Codein	Croton Chloral	Morphin
Opium	Phenacetin	Salicylates

Preparations

Anaphrodisiac.—A drug which depresses the sexual function.

Belladonna	Bromids	Camphor
Camphor Monobromate	Chloral	Digitalis
Hyoscin	Hyoscyamus	Lupulin
Opium	Valerian	

Anesthetic.—A drug producing local or general insensibility.

Local:

Carbolic Acid	Cocain	Ether
Ethyl Chlorid	Eucain	Holocain
	Menthol	

General:

Chloroform	Ether	Ethyl Bromid
	Nitrous Oxid	

Anodyne, Local.—A drug which when applied locally will relieve pain.

Aconite	Belladonna	Carbolic Acid
Camphor	Chloroform	Guaiacol
Ichthyol	Menthol	Opium
Turpentine	Volatile Oils	

Antacid.—A drug rendering acid solutions alkaline or neutral.

Ammonia-water	Chalk	Lime-water
Magnesia	Potassium Salts	Sodium Salts

Anthelmintic.—A drug that expels intestinal worms.

Aspidium	Chenopodium	Kousso
Male Fern	Pomegranate	Pumpkin Seeds
Quassia	Santonin	Spigelia
	Turpentine	

Anti-emetic.—A drug which arrests vomiting.

Bismuth Salts	Bromids	Cerium Oxalate
Cocain	Creosote	Menthol
Opium	Prussic Acid	

Antigalactagogue.—A drug which decreases or stops the flow of milk.

Belladonna	Camphor	Opium
	Saline Purgatives	

Antihydrotic.—A drug which diminishes the excretion of sweat.

Agaricin	Atropin	Belladonna
Camphoric Acid	Gallic Acid	Picrotoxin
Sulphuric Acid	Tannic Acid	

Antiperiodic.—A drug which prevents the periodic return of symptoms.

Arsenous Acid	Picric Acid	Quinin
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Antipyretic.—A drug which reduces fever.

Acetanilid	Aconite	Antipyrin
Benzoic Acid	Carbolic Acid	Cinchona
Phenacetin	Quinin	Resorcin
Salicylates	Veratrum Viride	

Antiseptic.—A drug which prevents the growth and development of bacteria.

Boric Acid	Carbolic Acid	Creolin
Creosote	Formaldehyd	Hydrogen Peroxid
Ichthyol	Lysol	Mercury Bichlorid
Potassium	Silver Nitrate	Thymol

Permanganate

Antisialagogue.—A drug which decreases the flow of saliva.

Atropin	Belladonna	Myrrh
Opium	Potassium Chlorate	

Antispasmodic.—A drug which tends to overcome muscular spasm.

Amyl Nitrite	Atropin	Belladonna
Bromids	Camphor Monobromate	Chloral
Hyoscin	Hyoscyamus	Nitroglycerin
Opium	Valerian	

Aperient.—A mild cathartic.

Aphrodisiac.—A drug which stimulates the sexual function.

Cantharides	Damiana	Nux Vomica
Phosphorus	Saw Palmetto	Strychnin

Astringent.—A drug which lessens secretions and discharges by contracting the tissues.

Acetic Acid	Bismuth Salts	Copper Salts
Gallic Acid	Hydrastis	Iron Salts
Lead Salts	Silver Nitrate	Tannic Acid
	Zinc Salts	

Cardiac Sedative.—A drug which lessens the heart's power and energy.

Aconite	Bromids	Gelsemium
Prussic Acid	Veratrum Viride	

Cardiac Stimulant.—A drug which increases the action and power of the heart.

Adonis Vernalis	Ammonia	Atropin
Barium Chlorid	Belladonna	Cactus
Caffein	Convallaria	Digitalis
Ether	Nitroglycerin	Spartein
Strophanthus	Strychnin	

Carminative.—A drug which aids in the expulsion of gas or flatus.

Calamus	Calumba	Cinchona
Gentian	Nux Vomica	Volatile Oils

Cathartic.—A drug which produces a positive evacuation of the bowels.

Chalybeate.—A drug which has iron as its principal constituent.

Cholagogue.—A drug which stimulates the flow of bile.

Aloes	Ammonium Chlorid	Benzoic Acid
Calomel	Ox-gall	Podophyllum
Sodium Choleate	Sodium	Salicylate

Counter-irritant.—A drug which stimulates the peripheral circulation in order to impress or effect distant tissues.

Acetic Acid	Alcohol	Ammonia
Cantharides	Capsicum	Croton Oil
Iodin	Mustard	Turpentine

Depilatory.—An agent for removing hair.

Diaphoretic.—A drug which increases the excretion of sweat.

Aconite	Dover's Powder	Pilocarpin
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Digestant.—A drug which has the power of digesting one or more forms of foodstuffs.

Amylopsin	Diastase	Hydrochloric Acid
Pancreatin	Papain	Pepsin

Disinfectant.—An agent which destroys germ life.

Carbolic Acid	Chlorin	Creolin
Formaldehyd	Mercury	Potassium
	Bichlorid	Permanganate

Diuretic.—A drug which increases urinary excretion.

Adonis	Apocynum	Arbutin
Caffein	Convallaria	Digitalis
Diuretin	Juniper	Nitroglycerin
Scoparius	Squill	Spirit of Nitrous Ether

Ecbolic.—A drug which produces uterine contraction.

Ergot	Hydrastis	Parsley
Quinin	Savine	

Emetic.—A drug which provokes vomiting.

Alum	Apomorphin	Copper Sulphate
Ipecac	Mustard	Tartar Emetic
Turpeth Mineral	Zinc Sulphate	

Emmenagogue.—A drug which augments the menstrual flow.

Aloin	Apiol	Ergot
Guaiaac	Iron Salts	Manganese Compounds
Pennyroyal	Savin	Tansy

Epispastic.—A drug which when applied to the external surface produces a blister.

Ammonia-water	Cantharides	Kerosene Oil
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Expectorant.—A drug which increases the bronchial secretions.

Ammonium Salts	Antimony	Apomorphin
Ipecac	Licorice	Senega
Squill	Terpin Hydrate	

Galactagogue.—A drug which increases the flow of milk.

Extract of Malt	Fluidextract of Castor Oil Leaves
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Hematinic.—A drug which increases the hemoglobin of the blood.

Arsenic	Cod-liver Oil	Iron Compounds
	Manganese Salts	

Hemostatic.—A drug which arrests hemorrhage.

Adrenalin	Cotarnin	Ergot
Hydrastis	Witch Hazel	

Hypnotic.—A drug which produces sleep which is more or less natural.

Bromids	Chloral	Chloralamid
Hyoscin	Opium	Paraldehyd
Sulfonal	Trional	

Laxative.—A mild cathartic.

Cascara Sagrada	Glycerin	Manna
Senna	Sulphur	Sweet Oil

Mydriatic.—A drug which causes a dilatation of the pupil.

Atropin	Belladonna	Daturin
Homatropin	Hyoscin	Stramonium

Myotic.—A drug which causes a contraction of the pupil.

Eserin	Pilocarpin
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Narcotic.—A drug which is capable of producing depression and stupor.

Conium	Hyoscin	Stramonium
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Oxytotic.—Same as Ecboic.

Ptyalagogue.—A drug which increases the flow of saliva.

Acids	Alkalies	Mercury Compounds
Pilocarpin	Volatile Oils	

Purgative.—A drug which produces a free evacuation of the bowels.

Colocynth	Elaterium	Gamboge
Jalap	Salines	Scammony

Rubefacient.—A drug which causes reddening of the skin when applied locally. (See Counter-irritants.)

Sedative, Nerve.—A drug producing quietness of nerve-centers.

Bromids	Camphor	Cimicifuga
Hyoscyamus	Lactucarium	Lupulin
Sumbul	Valerian	

Sialagogue.—Same as Ptyalagogue.

Somnifacient.—Same as Hypnotic.

Soporific.—Same as Hypnotic.

Stomachic.—A drug which stimulates the secretory and motor power of the stomach.

Acids	Alkalies	Calumba
Cinchona	Gentian	Hydrastis
Nux Vomica	Quassia	

Styptic.—A drug which locally checks hemorrhage.

Alum	Antipyrin	Copper Sulphate
Gallic Acid	Hydrogen Peroxid	Iron Salts
	Tannic Acid	

Sudorific.—Same as Diaphoretic.

Teniacide.—A drug which destroys intestinal worms. (See Anthelmintic.)

Vasoconstrictor.—A drug which causes a narrowing of the blood-vessels.

Cotarnin	Digitalis	Ergot
Hydrastis	Suprarenal Substance	

Vasodilator.—A drug producing vascular relaxation.

Amyl Nitrite	Nitrites	Nitroglycerin
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Vesicant.—Same as Epispastic.

DRUG ADMINISTRATION

When to Administer Drugs.

Bitters and drugs to stimulate the appetite should always be given before meals.

Alkalies given to increase the flow of gastric juice

should be administered before the meal. If given to neutralize the acidity of the gastric juice the proper time is after the meal.

Acids given to reinforce the natural hydrochloric acid should be administered one-half to one hour after the meal.

Such drugs as *mercury*, *arsenic*, *iron*, *iodids*, and *bromids* should not be given when the stomach is empty, but one-half to one hour after meals.

Silver nitrate, when used in the treatment of gastric ulcer, should only be given when the stomach is empty.

Laxatives that are slow in action are to be administered at night, and the more rapid-acting cathartics are best given the first thing in the morning.

Hypnotics are given in the evening before the hour of sleep. When they are given depends on the activity of the drug. Some hypnotics act in half an hour, others not for two or three hours.

Slowly acting drugs, as *digitalis*, should be administered at long intervals, and rapidly acting drugs, as *nitroglycerin* and *ammonia*, at very short intervals.

How to Administer Drugs.

It might be said as a general rule that all liquid preparations should be diluted with water before administering.

Iodids and *bromids* should never be given in dry form, powder or tablet, but should be dissolved in water and well diluted.

The *mineral acids* and the tincture of iron chlorid should be taken through a glass tube and well diluted.

The acids corrode the enamel of the teeth and the iron discolours them.

Saline cathartics if given simply to unload the bowels may be diluted, but when given to aid in the removal of fluid accumulations they should be administered in a concentrated form and very little water given to the patient until the salts have acted well.

In giving *bromids* to epileptic patients, the use of common salt in the diet should be reduced to a minimum in order to facilitate the maximum action of the bromids.

Arsenic given to patients taking bromids will prevent to a great extent the development of the eruption which so often follows the continuous use of the bromids.

Ergot or the bromids may prevent the occurrence of the ear and head symptoms of cinchonism if they are given in conjunction with the quinin.

Ill-tasting drugs should be given in capsules or kon-seals.

Methods of Administering Drugs.

By Mouth.—This is the most common of all the methods, and is the best except when very rapid results are desired.

Subcutaneously.—This method is very frequently used when rapid action is wished or when the stomach destroys the virtue of drugs given by mouth. (See Part V.)

By Rectum.—This method is employed when it is impossible to administer drugs by mouth, as in persistent vomiting, semi-consciousness, delirium, certain

diseases of the stomach, and when drugs by the mouth cause vomiting. Ill-tasting drugs may often be given to advantage by this method. Drugs used for local action on the rectum, bladder, and prostate gland must be applied this way.

By Inunction.—This consists of applying preparations, generally ointments or oily combinations, to the skin and rubbing them in. It is used much as a means of applying mercury (blue mass) in syphilis.

Endermically.—This method is used but little, if at all, at present. It is the application of drugs to the broken skin. A blister is raised and under the elevated epidermis the drug is placed.

Intravascularly.—This is another of the less-used methods. The drug in a soluble form is introduced into a vein. It is employed to a limited extent in administering certain mercury preparations in the treatment of syphilis.

Inhalation.—A much-used method of administering certain remedies in diseases of the respiratory tract.

Fumigation.—This consists of applying easily volatilized drugs by allowing the vapors of the same to come in contact with the skin of the patient. The body of the patient, excepting the head, is enclosed by a tent prepared by wrapping a sheet loosely about the patient. Underneath the tent a lamp and vessel containing the medicament is placed and the vapors allowed to collect under the tent in contact with the patient's body. There is danger of burning the patient, and in order to obviate this the vapor may be conducted to the tent by a tube from the vaporizer, which is placed some distance from the patient.

Cataphoresis.—This method consists of applying drugs to the skin, as in inunction, and then driving the medicament in by the application of an electric current.

How Much to Administer.

The size and frequency of a dose of medicine administered depends on many conditions.

Age.—The amount of drug given to elderly people and children differs from that for adults. Children bear certain drugs well and these may be given in very moderate doses, as belladonna; whereas other drugs, as opium, are borne very poorly by the young. To determine the dosage employed in administering drugs to children several methods have been advocated. Young says: "Add 12 to the age of the child and divide the age by this sum. For example: If the child be 3 years old; 3 plus 12 equals 15, and the age 3, divided by 15, is $\frac{1}{5}$ of the adult dose." Cowling advises: "Divide the next birthday by 24." This would make the dose for a child of 3 years $\frac{4}{24}$, or $\frac{1}{6}$ of the adult dose. The dose of a drug for a person over sixty years of age should be less than the adult dose.

Habituation.—The system gradually becomes accustomed to any drug taken for a protracted time, therefore it is often necessary to give a larger dose than usual to affect the system with that drug, as in giving whisky to alcoholics and opium to morphin fiends.

Administration.—Larger doses of the drug are to be given by mouth or rectum than by hypodermic.

Disease.—The character of the disease affects the dosage of the drug. Patients suffering from peritonitis

can stand larger doses of morphin than otherwise. Digitalis does not affect the heart-rate as readily when the fever is high.

Absorption and Excretion.—Drugs which are absorbed and eliminated rapidly may be given more frequently, as the nitrites, preparations of ammonia, ether, and alcohol. Drugs which accumulate in the system should be given at longer intervals, as digitalis and arsenic.

Condition of the Patient.—Neurotic individuals respond to small doses of drugs, especially if some suggestion has been given. On the other hand, persons with great mental excitement, as maniacs and insane patients, require enormous doses of sedative drugs, as opium and hyoscin, to quiet them.

DRUG CLASSIFICATION

The classification of drugs is arbitrary. There is no hard and fast rule by which medicinal agents may be classed or grouped. In the following classification the author has followed no prescribed course, but has arranged the drugs as seems to him simple and concise. The drugs are grouped first according to the major anatomic system upon which they act; and then subdivided according to the organ or function which they principally affect.

Drugs Acting on the Respiratory System

Under this system we will consider only two classes of drugs: Those acting on the bronchial secretions, known as expectorants, and those acting on the respiratory function and called respiratory stimulants.

Expectorants.—An expectorant, as has been pre-

viously noted, is a drug which increases or modifies the bronchial mucous secretion.

The pathology of bronchitis, laryngitis, etc., teaches us that in the first stage the mucous membrane is greatly reddened by vascular congestion and that the secretion is greatly decreased and tenacious, giving the lining of the larynx and bronchi a dry appearance, and, as the disease progresses, the excretion of mucus is increased.

From the description of the pathology of bronchitis it is easily seen that the treatment of the two stages differs. The drugs used as expectorants are divided into two classes: the *sedative* and the *stimulating*. The former are used in the early stage of bronchitis and the latter in the last stage.

The *sedative expectorants* are:

Ammonium Chlorid	Antimony and
Apomorphin	Potassium Tartrate
Ipecac	Licorice Senega

The *stimulating expectorants* are:

Benzoin	Creosote	Cubebs
Eucalyptus	Squill	Terpin Hydrate

Respiratory Stimulants.—As the name indicates, these drugs increase the action of the respiratory process. These drugs, as a rule, are stimulants in general, and do not act specifically on the respiratory apparatus. As is commonly known, the respiratory system is seldom depressed without corresponding depression of other vital functions, as the circulatory. It will be appreciated that drugs which stimulate the one function, as a rule, stimulate the other.

Alcohol	Ammonia	Ammonium Carbonate
Atropin	Ether	Strychnin

Drugs Acting on the Circulatory System

The drugs of this class will be considered in four divisions: Heart stimulants, heart sedatives, vasoconstrictors, and vasodilators.

Heart Stimulants.—These drugs increase the power of the heart by augmenting the rate or increasing the force of the heart. If, for instance, the heart does a certain amount of work by contracting 72 times per minute, it will do more work by contracting 90 times per minute, provided the contraction was equal in force or even five-sixths as forcible; or if the contractions number only 60 per minute and the force is increased sufficiently, the power of the heart will be greater.

Some drugs, as *digitalis* and *strophanthus*, increase the power of the heart by increasing its force but lessening its rate. Other drugs, as *ammonia*, *alcohol*, *ether*, and *strychnin*, increase both the rate and force of the heart.

The principal *heart stimulants* are:

Adonis Vernalis	Alcohol	Ammonia
Barium Chlorid	Belladonna	Cactus
Caffein	Camphor	Convallaria
Digitalis	Ether	Nux Vomica
Sparteïn	Squill	Strophanthus

Heart Sedatives.—These drugs decrease the power, force, and rate of the heart, and in excessive doses are heart depressants, increasing the rate but decreasing the power of the heart. The principal *heart sedatives* are:

Aconite	Bromids	Tartar Emetic
	Veratrum Viride	

Vasoconstrictors.—These drugs cause the blood-vessels to become smaller in caliber. By contracting the vessels they place a greater strain on the heart and raise the blood-pressure in the vessels. They act by affecting the centers in the brain or by influencing the nerve filaments in the vessel walls.

Acetanilid	Belladonna	Cotarnin
Digitalis	Ergot	Suprarenal Extract

Vasodilators.—These drugs produce a relaxation of the vessel walls and lower the blood-pressure, relieving the heart of considerable work.

Amyl Nitrite	Nitrites	Nitroglycerin
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Drugs Acting on the Alimentary System

The alimentary system is very extensive and is composed of many organs, hence it is natural to suppose that drugs acting on this system should be divided into many groups.

The classes to be considered are: Stomachics, digestives, emetics, anti-emetics, cathartics, antiseptics, astringents, and anthelmintics.

Stomachics. — These drugs increase the motor power of the stomach, stimulate the flow of the juices, sharpen the appetite, and bring about a general tonic effect. The drugs, as a rule, are bitters or of the volatile-oil type. Those of the latter class act as carminatives and assist in expelling gas or flatus from the stomach.

Absinth	Alcohol	Calamus
Calumba	Capsicum	Cinchona
Gentian	Ginger	Hydrastis
Nux Vomica	Quassia	Rhubarb

Digestives.—These drugs are divided into two classes, according to their origin, animal and vegetable.

The *animal* are:

Ingluvin	Pancreatin	Pepsin
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The *vegetable* are:

Bromelin	Diastase	Papain
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Emetics.—These drugs produce vomiting. Their uses are several: To empty the stomach when it is overloaded or contains irritating or poisonous material; to aid in expelling mucus or other substances from the upper respiratory tract; to relax muscular spasm of the respiratory tract, as in asthma and croup. Emetics act either locally on the stomach or centrally in the brain.

Apomorphin	Ipecac	Mustard
Tartar Emetic	Zinc Sulphate	

Anti-emetics.—These drugs oppose the emetics and act as gastric sedatives.

Cerium Oxalate	Bismuth Preparations	Magnesia
	Prussic Acid	

Cathartics.—In this class are many drugs, and they should be subdivided into several groups, depending on their action.

Cathartics are used to cure constipation, to unload the bowels, to remove water from the system, and to affect distant tissues.

As a cure for constipation, those drugs whose action is followed by constipation should not be employed, for the result we wish to attain is thus defeated. Such drugs as cascara and sodium phosphate, which have a tonic action on the bowels, are of service.

In diseases accompanied by the collection of fluids

in the tissues, cathartics which produce copious watery movements are of great value. These cathartics are known as the hydragogue purgatives, and are represented by salines, jalap, and mercury.

In diseases of the acute inflammatory type, it is often useful to administer drugs which irritate the intestinal tract, thus drawing blood from the affected parts. Such drugs as croton oil and scammony are typical.

Cathartics may be classed as follows :

Simple laxatives, or those drugs which produce a slight movement of the bowels.

Cassia Fistula	Cascara Sagrada	Glycerin
Licorice	Manna	Prune
	Senna	

Purgatives, or those which produce more copious bowel movements.

Aloes	Calomel	Castor Oil
Podophyllum	Rhubarb	

Drastic purgatives are very vigorous-acting drugs. They produce marked irritation and excessive bowel movements.

Colocynth	Croton Oil	Elaterium
Gamboge	Jalap	Scammony

Saline cathartics are :

Magnesium Sulphate (Epsom salt)	Potassium Bitartrate (Cream of Tartar)
Sodium Phosphate	Sodium Sulphate (Glauber salt)
Sodium and Potassium Tartrate (Rochelle salt)	

Cholagogue purgatives increase the secretion of bile.

Calomel	Ox-gall	Podophyllum
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Intestinal Antiseptics.—These drugs tend to over-

come fermentation and bacterial processes in the intestinal canal.

Creosote	Guaiacol	Naphtol
Ox-gall	Sulphocarbolates	Thymol

Intestinal Astringents.—These drugs check the flow of intestinal juices, decrease the motor power to some extent, and are useful in overcoming diarrheal conditions.

Alum	Chalk	Catechu
Gallic Acid	Kino	Sulphuric Acid
Tannic Acid	Zinc Sulphate	

Anthelmintics.—These agents are divided into three classes, depending on the parasite on which they especially act.

On the Tapeworm:

Aspidium	Cusso	Pomegranate
Pumpkin Seed	Thymol	

On the Round-worm:

Aloes	Santonin	Spigelia
	Turpentine	

On the Pin- or Seat-worm:

Quassia	Salicylic Acid	Salt
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Drugs Acting on the Nervous System

This class includes drugs acting on the nervous tissues, whether brain, cord, or peripheral nerves.

Anesthetics.—These drugs produce insensibility, either by their action on the brain centers or locally. These agents are principally used by the surgeon, but are also employed by the physician in overcoming spasms, convulsions, epileptic and eclamptic seizures, and for the relief of intense pain.

The principal *general anesthetics* are :

Chloroform	Ether	Nitrous Oxid
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The *local anesthetics* are :

Cocain	Ethyl Chlorid	Eucain
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Hypnotics.—

Bromids	Chloral Hydrate	Chloralamid
Hyoscin	Opium	Sulfonal
	Trional	

Nerve Sedatives.—Under this heading are included drugs which are commonly known as *anti-spasmodics*, and such as are generally called *motor depressants*.

Asafetida	Bromids	Bromoform
Camphor	Camphor	Cannabis Indica
	Monobromate	
Gelsemium	Hops	Hyoscyamus
Musk	Physostigma	Stramonium
	Valerian	

Analgesics.—These drugs are given internally for the relief of pain. It is well to note that nearly all members of this class are more or less depressing to the cardiac function and should be used with caution, especially those of the coal-tar series, and should be reinforced by stimulants.

Acetanilid	Aconite	Ammonium Chlorid
Antipyrin	Belladonna	Camphor Monobromate
Cannabis Indica	Cimicifuga	Colchicum
Gelsemium	Oil of Gaultheria	Opium
Phenacetin	Salicylates	

Drugs Acting on the Nervous Mechanism of the Eye.—

Mydriatics :

Belladonna	Cocain	Homatropin
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Myotics :

Physostigmin or Eserin	Pilocarpin
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Drugs Acting on the Urinary Tract

The drugs of this class are divided into three groups : The *diuretics*, or those increasing the flow of urine ; the *antiseptics*, or those which render the urine more or less antiseptic ; the *stimulants*, which form an indeterminate group and comprise those drugs which act especially on the mucous membrane of the bladder and lower urinary tract, which is stimulated slightly by these drugs during their excretion.

Diuretics.—These are best studied in three groups, depending on their mode of action. Some of the drugs act directly on the kidney tissue and are known as the *stimulating diuretics* :

Juniper	Cantharides	Turpentine	Uva Ursi
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The second class of diuretics produces an increase of urine by altering the blood supply of the kidney. They may be cardiac stimulants, thus increasing the amount of blood to the kidney ; they may act on the general vascular system, increasing the tension and thereby increase the blood in the kidneys ; or they may simply dilate the renal vessels. These drugs, for want of better nomenclature, will be designated as *systemic diuretics* :

Adonis Vernalis	Caffein	Calomel	Convallaria
Digitalis	Scoparius	Squill	Strophanthus

The third group consists of drugs derived principally from the saline division. These render the urine bland, and thus tend to increase the flow of this excretion.

Lithium	Lithium Citrate	Potassium Acetate
Carbonate		
Potassium	Potassium	Sodium Acetate
Citrate	Nitrate	
Sodium Citrate	Strontium Salts	

Diuretics are used for several purposes : To increase the urinary flow in diseases in which it is partially suppressed, to remove abnormal collections of fluid, as in effusive pleurisy, pericarditis or peritonitis, etc., and to increase the excretion of poisons and toxins in uremia, eclampsia, and toxemia.

Urinary Antiseptics.—The drugs of this class are excreted in the urine and thus tend to render this fluid feebly antiseptic, either by their own virtue or by products formed from these drugs while in the system.

Benzoates	Benzoic Acid	Boric Acid
Methylene-blue	Sandalwood	Urotropin

Urinary Stimulants.—This is an arbitrary class, but comprises those drugs which, when excreted in the urine, lessen its irritation, act as stimulants to the mucous membrane of the bladder and urethra, and may act as sedatives.

These drugs are not used for the purpose of stimulating the flow of urine, but for their local action on the lower urinary tract.

Boric Acid	Buchu	Copaiba
Cubebs	Hyoscyamus	Sandalwood
Triticum	Turpentine	Uva Ursi
	Zea Mays	

Drugs Acting on the Genital Tract

The drugs of this class will be considered in two groups: Those acting on the menstrual function and those affecting the uterine musculature.

Emmenagogues cause the menstrual flow to become normal in amount, when for any reason it is pathologically absent or decreased in quantity. These drugs are of uncertain action. They act on the genital organs primarily or produce results by influencing the general system.

The *former type* is represented by:

Apiol	Manganese	Pennyroyal
Rue	Savin	Tansy

The *latter type* by:

Aloes	Cathartics	Cod-liver Oil
Iron Preparations	Strychnin	

Uterine Stimulants.—Included in this group are those drugs acting on the uterine muscles, causing their contraction. They are used after labor to aid the uterus in becoming firm and small.

Cotton-root Bark	Ergot	Hydrastis
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Drugs Affecting Metabolism

This class is more or less ill defined and includes those drugs which aid in building up tissues and fluids of the body or help the system to overcome morbid processes. These drugs are called *alteratives*.

Arsenic Compounds	Cod-liver Oil
Colchicum	Ichthyol
Iodids	Iron Preparations
Manganese Compounds	Mercurials
Phosphorus Compounds	Thyroid Extract

Drugs Acting on the Heat Mechanism

The drugs considered in this section are those which reduce the temperature, and are called *antipyretics*. Their action is accomplished by increasing the dissipation of heat or decreasing heat production.

Acetanilid	Aconite	Alcohol
Antipyrin	Benzoates	Cinchona
Guaiacol	Phenacetin	Picric Acid
Resorcin	Salicylates	

Drugs Acting on the Excretory Apparatus

Among the principal channels of secretion and excretion are the bowels, kidneys, skin, salivary glands, and breasts. Drugs acting on the bowels and kidneys have been considered.

Drugs Affecting the Sweat Glands

Antihidrotics are drugs which decrease the excretion of sweat.

Agaricin	Belladonna	Camphoric Acid
Formaldehyd	Gallic Acid	Tannic Acid

Diaphoretics, or drugs increasing perspiration.

Aconite	Camphor	Dover's Powder
Pilocarpin	Spirit of Nitrous Ether	

Drugs Affecting the Salivary Glands

Sialagogues. —	Antisialagogues. —
Acids	Belladonna
Alkalies	Borax
Iodids	Myrrh
Mercurials	Opium

Drugs Affecting the Mammary Glands

At times it is necessary either to increase or diminish the mammary secretion.

Galactagogues.—	Antigalactagogues.—
Ammonium Chlorid	Belladonna
Castor Oil (Fluidextract)	Camphor
Malt Extract	Ergot
Pilocarpin	Saline Purgatives

Drugs Acting Externally

The members of this division will be considered in four classes: Counter-irritants, antiseptics, vulneraries, and astringents.

Counter-irritants are those agents which when applied locally will stimulate the peripheral circulation, produce a localized increase of blood or serum in the part, and thus relieve more distant tissues. They relieve pain by reducing the tension and congestion of the affected area; they aid in the absorption of fluid accumulations; they are antiphlogistic, *i. e.*, relieve inflammation.

The counter-irritants are classified according to the degree of action exerted. If only reddening of the skin is produced the drug is called a rubefacient. If blisters or vesicals are formed, a vesicant or epispastic. If tissues are destroyed, a caustic or escharotic.

Rubefacients:

Ammonia	Capsicum	Chloroform
Ginger	Iodin	Mustard
	Turpentine	

Vesicants:

Ammonia	Cantharides	Croton Oil
	Kerosene Oil	

Caustics :

Acetic Acid	Arsenous Acid	Chromic Acid
Nitric Acid	Potassium Bichromate	
Silver Nitrate	Sulphuric Acid	Zinc Chlorid

Antiseptics.—These agents are used principally in surgery to retard or check bacterial growth and life. The most-employed strength is noted after the name of the drug.

Antipyrin	Benzoic Acid	Boric Acid (1-25)
Carbolic Acid (1-20)	Creolin (1-50)	Formaldehyd (1-100)
Hydrogen Peroxid (3 per cent.)	Iodoform	Mercury Bichlorid (1-1000)
Potassium Permanganate (1-1000)		Resorcin

Vulneraries are those drugs which aid in the healing of wounds by stimulating the formation of granulation tissue and encouraging cicatrization.

Balsam of Peru	Chrysarobin	Ichthyol
	Silver Nitrate	

Astringents when applied locally contract the tissues and diminish any discharge from wounds or the cutaneous surface.

Alum	Hydrastis	Iron Salts
Lead Salts	Mineral Acids	Tannic Acid
	Zinc Salts	

PART II

GENERAL MATERIA MEDICA, THERAPEUTICS, AND TOXICOLOGY

(Note.—Drugs marked (*) are found in Part III.)

ABSINTH (*)

ACACIA (*)

ACETANILID

Derivation.—A coal-tar product produced by the action of glacial acetic acid on anilin.

Synonyms.—Antifebrin, Phenylacetamid.

Solubility.—Acetanilid is soluble in water (200 parts), alcohol (5 parts), ether (18 parts), chloroform (freely).

Properties.—It is a white, crystalline, odorless powder with a burning taste.

Incompatibilities.—Sweet spirit of niter, chloral hydrate, bromids, and iodids.

Dosage.—2–10 grains.

Physiologic Action.

Antipyretic.—Acetanilid is a powerful antipyretic. On the normal temperature its action is slight, but

when given in febrile conditions it rapidly lowers the temperature, which may become subnormal.

Analgesic.—Acetanilid is principally used to relieve pain. The drug acts as a powerful sedative to the sensory nerve tissues, bringing about an anesthetic and analgesic action.

Antiseptic.—This drug also possesses antiseptic properties to some degree, and is much used for this purpose in the treatment of wounds.

Cardiac Depressant.—Acetanilid depresses the heart action very perceptibly in large doses, and on this account should be used with caution in susceptible persons.

Hemostatic.—When taken internally or applied locally, this drug causes contraction of the blood-vessels.

Comparative Action.—Compared to *antipyrin*, acetanilid produces a stronger pulse, has a more marked action on the blood, and cyanosis is frequent, but it is less powerful as an analgesic and in its local action on the blood-vessels.

Compared to *phenacetin*, acetanilid is less safe, but more analgesic.

Therapeutic Indications.

As an *antipyretic* in fevers, influenza, and tuberculosis.

As an *analgesic* in headaches, migraine, neuralgias, sciatica, rheumatism, influenza, dysmenorrhea, and locomotor ataxia.

As an *antiseptic* in dressing wounds, ulcers, chancre, and chancres.

As a *hemostatic* it is used locally in nosebleed and oozing of blood from wounds.

Administration.—Acetanilid is best given in the form of tablets or in capsules. Owing to its depressing action on the heart, acetanilid should be reinforced by strychnin, caffenin, or camphor. It should be given in small doses to susceptible persons. The author has known 2 grains of this drug to cause cyanosis and cold blue finger-tips in an adult.

Pretoxic Signs.—Slight cyanosis of the lips and face, sweating, and slowness of the pulse.

Toxicology.—After large doses signs of poisoning may rapidly appear, as cyanosis, slow respirations, feeble and irregular pulse, vomiting, cold, moist skin, and collapse.

Management.—Empty the stomach by means of a stomach-pump or tube or with emetics, as tepid water, salt-water, or mustard-water. Stimulate with aromatic spirit of ammonia, strychnin, atropin, or brandy. Apply heat externally by means of hot-water bags, hot bricks, or hot flat-irons.

ACETIC ACID

Derivation.—A clear, colorless liquid with an acid taste and a vinegar-like odor, obtained by the distillation of wood.

Incompatibilities.—Alkalies and bicarbonates.

Preparations.

Glacial Acetic Acid (99 per cent. strength).

Acetic Acid (36 per cent. strength).—Dose, 10–30 minims.

Dilute Acetic Acid (6 per cent. strength).—Dose, 1–3 drams.

Vinegar (Acetum) is a form of dilute acetic acid.

Physiologic Action.

Caustic.—Glacial acetic acid when applied locally reddens the skin and causes formation of blisters. If the action continues it will destroy the tissues.

Astringent.—Given internally or applied locally acetic acid constricts the blood-vessels, astringes the tissues, and thus causes a decrease in the secretion of intestinal juices and sweat.

Stimulant.—When inhaled the drug reflexly stimulates cardiac and respiratory action.

Therapeutic Indications.

As a *caustic* for removing warts, corns, vegetations, and small growths.

As an *astringent* in night-sweats of tuberculosis, nosebleed, postpartum hemorrhage, and in diarrhea.

As a *stimulant*, by inhalation, in asphyxia and syncope.

The inhalation of the vapor of acetic acid or vinegar will at times stop vomiting which has resisted all other treatment.

Toxicology.—Acetic acid in poisonous doses produces vomiting, griping, collapse, convulsions, and paralysis.

Management.—Dilute the poison by giving water. Neutralize it with soap-water, chalk, milk, oils, or white of egg. Stimulate if necessary.

ACONITE

Derivation.—The root of *Aconitum Napellus*.

Synonyms.—Monkshood, Wolfsbane.

Constituent.—An alkaloid (Aconitin), which occurs in crystalline and amorphous forms.

Dosage.— $\frac{1}{2}$ –2 grains.

Preparations.

Extract.—Dose, $\frac{1}{8}$ – $\frac{1}{2}$ grain.

Fluidextract.—Dose, $\frac{1}{4}$ –1 minim.

Tincture.—Dose, 1–3 minims.

Aconitin (crystalline).—Dose, $\frac{1}{600}$ – $\frac{1}{200}$ grain.

Aconitin (amorphous).—Dose, $\frac{1}{40}$ – $\frac{1}{15}$ grain.

Physiologic Action.

Analgesic.—Aconite depresses the ends of the sensory nerve-fibers, causing a tingling sensation and numbness of the parts.

Cardiac Sedative.—In medicinal doses this drug acts as a sedative to the heart, producing a slower and less forcible cardiac action.

Vasodilator.—Aconite lowers the blood-pressure by dilating the blood-vessels and by its action on the heart and vasomotor centers in the brain.

Respiratory Sedative.—The respirations become slower under the action of aconite.

Antipyretic.—From its action on the heart and blood-vessels this drug reduces the temperature in febrile conditions.

Diuretic.—Aconite, being largely eliminated by the kidneys, stimulates these organs and causes an increase in the amount of urine.

Therapeutic Indications.

As an *analgesic* it is used locally in neuralgias as a liniment. Aconite is given internally for the same action in rheumatism, neuralgias, sciatica, dysmenorrhea, and migraine. As a gastric analgesic it is useful in the vomiting of pregnancy.

As a *cardiac* and *vasomotor sedative* it is used in

hypertrophy of the heart, and cardiac palpitation. In the beginning of acute fevers, as pneumonia, scarlet fever, and erysipelas. In pleurisy, pericarditis, bronchitis, and epistaxis.

Administration.—Aconite is very rapidly absorbed and eliminated, therefore it may be given, frequently repeated, in small doses.

Pretoxic Signs.—Slowness of the pulse, tingling of the skin, and numbness.

Toxicology.—In large doses aconite produces muscular weakness, a slow, weak pulse, which becomes rapid and irregular, collapse, and convulsions.

Management.—Evacuate the stomach by means of a stomach-tube, but do not use emetics, as these cause additional heart depression. Give tannic acid as an antidote. Stimulate with ether, alcohol, strychnin, digitalis, or atropin.

ADONIS VERNALIS (*)

AGAR-AGAR

Agar-agar, sometimes known as vegetable gelatin, is derived from a seaweed common in the vicinity of Japan and the islands of the East. This substance is now widely employed in the treatment of chronic constipation. Its action is purely mechanical. When agar-agar reaches the intestines it absorbs moisture and swells to a considerable degree, and then by means of its bulk it stimulates peristalsis. Agar-agar jelly is not acted upon by the digestive juices. From 1 to 4 drams may be considered as the dose. It is usually mixed with some food, preferably a dry cereal. Added to bran biscuits it is very helpful.

AGARICIN (*)

ALCOHOL

Derivation.—A liquid obtained by the fermentation and distillation of saccharine substances, and contains 91 per cent. of ethyl hydrate.

Synonyms.—Ethyl Alcohol, Spirit of Wine, Common Alcohol.

Incompatibilities.—Acacia, albumin, and perman-ganates.

Properties.—It is a colorless, transparent, volatile liquid, with a pleasant odor and a burning taste.

Preparations.

Absolute Alcohol contains 1 per cent. of water.

Deodorized Alcohol contains 7.5 per cent. of water.

Common Alcohol contains 9 per cent. of water.

Dilute Alcohol contains 58.5 per cent. of water.

Brandy (Spiritus Vini Gallici) contains about 45 per cent. of alcohol, and is obtained by the distillation of grape wine.

Whisky (Spiritus Frumenti) contains about 47 per cent. of alcohol, and is obtained by the distillation of certain grains, as rye, corn, and wheat.

Rum is obtained by the distillation of molasses, and contains about 42 per cent. of alcohol.

Gin (Spiritus Juniperis Comp.) is common grain spirits distilled with juniper berries, and contains about 45 per cent. of alcohol.

Red Wine (Vinum Rubrum) is obtained by the fermentation of the entire grape, and contains from 7 to 12 per cent. of alcohol. Red wines contain tannic acid and are constipating. The

principal red wines are Claret, Bordeaux, and Port.

White Wine (Vinum Album) is obtained by the fermentation of the juice of grapes, and contains from 7 to 12 per cent. of alcohol. The common white wines are Sherry, Madeira, and Catawba.

Champagne is a charged or carbonated wine, containing from 5 to 15 per cent. of alcohol.

Beer is obtained by the slow fermentation of malted barley and hops, and contains from 2 to 5 per cent. of alcohol.

Ale is prepared by the rapid fermentation of malted barley and hops, and contains from 4 to 7 per cent. of alcohol.

Physiologic Action.

Cerebrospinal Excitant.—Alcohol acts upon the brain and spinal cord, stimulating the centers to a marked degree. Over-doses cause depression.

Cardiac Stimulant.—Alcohol acts as a powerful cardiac stimulant, producing a more rapid and forcible heart action. The pulse becomes full and the arterial pressure is somewhat elevated. Large doses paralyze the heart.

Antipyretic.—Alcohol in moderate doses causes a fall of body temperature.

Gastric Stimulant.—This drug in minute doses increases the flow of gastric juice, but in large doses retards the action of the digestive ferments.

Large doses of alcohol may depress any of the vital functions and act as a poison.

Therapeutic Indications.

As a *cardiac stimulant* in acute heart depression, as syncope, collapse, and shock. In cardiac failure or weakness of acute fevers, as pneumonia, typhoid fever, and in poisoning due to aconite, veratrum viride, anesthetics, and snake venom.

Alcohol is also indicated in wasting diseases, in persistent vomiting, as an external application in sweating, and to prevent the bed-sores of typhoid fever.

Administration.—As a stimulant in cardiac depression use either whisky or brandy. In persistent vomiting, brandy or champagne on cracked ice are to be used.

Toxicology.—*Acute poisoning* is characterized by flushing of the face, rapid pulse, mental excitement, incoherent speech, vomiting, stupor, and coma.

Management.—Empty the stomach at once by means of a stomach-tube or a strong emetic, as apomorphin ($\frac{1}{10}$ grain, by hypodermic). Stimulate with aromatic spirit of ammonia, strychnin, digitalis, or strong coffee (per rectum). Apply heat externally.

Chronic poisoning presents the following picture: Tremor, mental impairment, insomnia, nausea or vomiting, dyspepsia, redness of the eyes. In advanced cases, delirium tremens occurs with cerebral excitement, inability to sleep, incoherency of speech, tremor and hallucinations, followed by mania and coma.

Management.—Withdraw the cause (alcohol) and supply the necessary stimulation by giving strychnin nitrate. Encourage the appetite with capsicum and bitters. Aid sleep with hypnotics, quiet delirium and mental excitement with bromids and chloral (use caution). Provide abundant and nourishing diet.

ALOES

Derivation.—The dried juice of the leaves of *Aloe Perryi* and *Aloe Socotrina*.

Constituent.—A crystalline substance called Aloin.

Preparations.

Purified Aloes.—Dose, 1–10 grains.

Extract.—Dose, 1–5 grains.

Tincture.—Dose, 15–60 minims.

Tincture of Aloes and Myrrh.—Dose, 1–2 drams.

Aloin.—Dose, $\frac{1}{4}$ –2 grains.

Also several pills.

Physiologic Action.

Cathartic.—Aloes stimulates the flow of bile and intestinal juices. This drug acts especially on the lower end of the bowels. Its action is slow and usually takes from twelve to eighteen hours.

Emmenagogue.—Aloes acts as a stimulating emmenagogue, causing an increased menstrual flow when it is scanty.

Vermifuge.—The drug is a useful anthelmintic for the round-worm and seat-worms.

Therapeutic Indications.—As a *cathartic* in chronic constipation. It is too slow in action for acute constipation.

As an *emmenagogue* in atonic amenorrhea accompanied by constipation and anemia.

As an *anthelmintic* for round- and pin-worms.

Administration.—Aloes or aloin is very seldom given alone, but usually combined with belladonna or strychnin. It should not be employed in constipation accompanied by inflamed piles. As an emmenagogue

it is best given with an iron preparation. For seat-worms it is used in the form of an enema.

ALUM

Derivation.—A double salt formed by the action of heat on alum stone and then purified.

Synonyms.—Potassio-aluminum Sulphate, Potash Alum.

Properties.—Alum occurs in large, colorless crystals, and is soluble in water (10 parts), glycerin (freely), but insoluble in alcohol. Heated to redness it becomes *Burnt Alum* (*Alumen Exsiccatum*).

Incompatibilities.—Alkalies, lime-water, lead acetate, tannic acid, and iron salts.

Dosage.—5–30 grains.

Physiologic Action.

Astringent.—Alum applied externally or given internally coagulates albumin and constricts the tissues, thus hardening the skin and decreasing the cutaneous and alimentary secretions.

Emetic.—This drug, by its irritation on the lining of the stomach, provokes vomiting.

Therapeutic Indications.

As an *astringent* in epistaxis, sore throat, tonsillitis, leukorrhea, hemorrhages, night-sweats, diarrhea, etc.

As an *emetic* in acute poisonings and membranous croup.

Administration.—As an emetic alum should be given in doses of 1 to 2 drams.

Toxicology.—Very large doses produce vomiting and purging.

AMMONIAC (*)

AMMONIUM COMPOUNDS

AMMONIA-WATER

Derivation.—A watery solution of ammonia gas of 10 per cent. strength.

Properties.—A volatile, colorless liquid, with a very irritating, pungent odor.

Incompatibilities.—Acids, alkaloids, metallic salts, iodine, and chlorine-water.

Dosage.—10–30 minims.

Preparations.

Liniment contains 35 per cent. of ammonia-water.

Spirit.—Dose, 10–60 minims.

Aromatic Spirit contains ammonia-water, ammonium carbonate, and essential oils. Dose, $\frac{1}{2}$ –2 drams.

Stronger Ammonia-water, containing 28 per cent. of ammonia gas. Dose, 4–8 minims, well diluted.

Physiologic Action.

Rubefacient.—Ammonia-water when applied to the skin acts as an irritant and causes redness of the surface.

Cardiac and Respiratory Stimulant.—When inhaled or given internally this drug quickly produces a rapid and forcible heart, and causes an increase of the respiratory rate.

Spinal Stimulant.—Spinal activity is augmented and convulsions may be brought about.

Therapeutic Indications.

As a *stimulant* in fainting, syncope, sudden cardiac failure of pneumonia, typhoid fever, shock, anesthetization, and in snake-bites.

As a *rubefacient* it is used in the form of a liniment in neuralgias, rheumatism, and sprains.

Administration.—For rapid stimulation it may be used as an inhalant. Care must be used when this strongly irritating drug is employed by inhalation for patients in an unconscious condition, as burns and serious inflammations of the upper respiratory tract may result. Ammonia preparations should always be well diluted before administering.

Toxicology.—In poisonous doses ammonia produces abdominal colic, vomiting, purging which may become bloody, convulsions, and collapse.

Management.—Neutralize the poison with acid solutions, as vinegar, lemon-juice, or dilute hydrochloric acid. Give mucilaginous drinks, as albumin-water, olive oil, flaxseed-tea, milk, or chalk-water. Do not use a stomach-tube, as a perforation of the stomach wall may result.

AMMONIUM BENZOATE

This drug has the same action as Benzoic Acid (to which you are referred).

Dosage.—10–30 grains.

It is soluble in water (6 parts), alcohol (28 parts), glycerin (8 parts).

Incompatibilities.—Iron salts and acids.

AMMONIUM BROMID

This salt has the same action as Potassium Bromid (to which you are referred), excepting that the ammonium salt is less depressing.

Dosage.—15–30 grains.

It is soluble in water (2 parts), alcohol (30 parts).

Incompatibilities.—Mercury and silver salts, acids, and alkaloids.

AMMONIUM CARBONATE

Synonyms.—Volatile Salt, Sesquicarbonate of Ammonia.

Properties.—A white, transparent substance with an irritating, ammoniac odor. It is soluble in water (5 parts), alcohol (200 parts).

Incompatibilities.—Iron, lead and silver salts, acids, alkaloids, and calomel.

Dosage.—5–30 grains.

Preparations.

Aromatic Spirit of Ammonia.—(See under Ammonia-water.)

Solution of Ammonium Acetate.—This is commonly known as the spirit of Mindererus, and is prepared by the action of acetic acid on ammonium carbonate. Dose, 1–4 drams.

Physiologic Action.

The action of this salt is the same as that of ammonia-water, and in addition the carbonate is an excellent *expectorant* and *gastric antacid*.

Therapeutic Indications.

As a *cardiac stimulant* and rubefacient it is used the same as ammonia-water. As an *expectorant* it is useful in acute and chronic bronchitis, pneumonia, and pulmonary tuberculosis. As an *antacid* in acid dyspepsia.

Administration.—This drug should always be given in solution and well diluted.

AMMONIUM CHLORID

Synonyms.—Sal Ammoniac, Muriate of Ammonia.

Properties.—It is a white powder with an intensely salty taste. Is soluble in water (3 parts), glycerin (5 parts), and nearly insoluble in alcohol.

Dosage.—5–30 grains.

Preparation.

Lozenge (1½ grains).

Physiologic Action.

Expectorant.—This salt increases the bronchial secretions and makes them thin and watery.

Cholagogue.—Sal ammoniac is said to increase and liquefy the bile.

Analgesic.—This drug lessens, to a great degree, pain of neuralgic character.

Therapeutic Indications.

As an *expectorant* in acute and chronic bronchitis, catarrhal pneumonia, and laryngitis.

As a *cholagogue* in torpor of the liver, catarrhal jaundice, and hepatic congestion.

As an *analgesic* in neuralgias, hemicrania, dysmenorrhea, rheumatism, and sciatica.

AMMONIUM IODID

This salt has the same action as Potassium Iodid (to which you are referred). The ammonium salt is less depressing.

Dosage.—5–30 grains.

AMMONIUM VALERIANATE

The action of this drug is about the same as that of Valerian (which see).

Dosage.—2–8 grains.

AMYL NITRITE

Definition.—A clear, lemon-colored, very volatile liquid, having an odor resembling that of banana.

Dosage.—1–5 minims.

Physiologic Action.

Vasodilator.—Amyl nitrite, when taken by inhalation or by mouth, very rapidly produces great vasodilatation, causing cutaneous flushing, roaring in the ears, fulness of the head, and a rapid, full pulse.

Antispasmodic.—This drug produces great muscular relaxation.

Comparative Action.—Compared to nitroglycerin, amyl nitrite is much more rapid in action, but the results are of much shorter duration.

Therapeutic Indications.

As a *vasodilator* in shock, chloroform- and cocaine-poisoning, in angina pectoris, syncope, and dyspnea.

As an *antispasmodic* in angina pectoris, asthma, tetanus, convulsions, epileptic paroxysms, spasmodic dysmenorrhea, hysteric seizures, strychnin-poisoning, and whooping-cough.

Administration.—This drug is most frequently given by inhalation, 3 to 5 drops are placed on a handkerchief and applied to the nostrils. Many drug houses place this preparation on the market in thin glass “pearls,” which can be easily broken when needed.

ANTIMONY AND POTASSIUM TARTRATE

Derivation.—A double salt, formed by the action of antimony oxid on cream of tartar.

Synonyms.—Tartar Emetic, Tartrated Antimony.

Properties.—A white, crystalline powder, without odor, and having a sweetish taste. It is soluble in

water (17 parts), glycerin (21 parts), but insoluble in alcohol.

Incompatibilities.—Tannin, lead salts, and carbonates.

Dosage.— $\frac{1}{30}$ – $\frac{1}{15}$ grain. As an emetic, $\frac{1}{2}$ grain.

Preparations.

Wine.—Dose, 5–60 minims.

Compound Syrup of Squill contains 0.2 per cent. of tartar emetic and 8 per cent. each of fluid-extracts of squill and senega. Dose, 5–30 minims.

Physiologic Action.

Emetic.—Tartar emetic acts upon the stomach walls as an irritant, and causes vomiting with great nausea.

Heart Depressor.—This drug is a powerful cardiac depressant. In small doses it decreases both the force and rate of the heart.

Spinal Depressant.—Antimony depresses the sensory part of the cord, causing cutaneous anesthesia and loss of reflexes. It also produces muscular relaxation by depressing the motor segment of the cord.

Expectorant.—The drug, being partially eliminated by the bronchial mucous membrane, increases the expectoration.

Diaphoretic.—By virtue of its depressing action, tartar emetic increases the excretion of sweat.

Caustic.—Locally, the drug acts as a destroyer of tissue and produces pustules.

Therapeutic Indications.

As an *emetic* it is but little used on account of its depressing action.

As a *heart sedative* in the beginning of sthenic diseases, as pneumonia, bronchitis, laryngitis, and acute "colds."

Administration.—This drug should always be used with great caution and its action carefully watched.

Toxicology.—The pulse at first is slow, but soon becomes rapid, weak, and irregular. The skin is cold and moist. Nausea, vomiting, and violent purging are prominent. Collapse soon follows.

Management.—Wash out the stomach and give tannic acid freely. Apply heat externally and stimulate with alcohol, strychnin, and digitalis.

ANTIPYRIN

Properties.—Antipyrin is a coal-tar derivative, occurring as a white, crystalline powder, having a bitter taste but no odor. It is soluble in water (2 parts), ether (52 parts).

Incompatibilities.—Benzoates, calomel, chloral, iodids, saleratus, sweet spirit of niter, and tincture of iron chlorid.

Dosage.—5-15 grains.

Physiologic Action.

Analgesic.—Antipyrin, when given internally or applied locally, depresses the sensory nerve filaments, producing an analgesic effect.

Antipyretic.—This drug reduces the body temperature to a marked degree.

Styptic.—If given internally or applied locally, antipyrin produces a contraction of the smaller blood-vessels.

Antiseptic.—This drug, in small amounts, will stop fermentation. A 4 per cent. solution will destroy the *Bacillus communis* and prevent spore formation.

Comparative Action.—Antipyrin is more analgesic

and has less destructive action on the blood than acetanilid. Antipyrin is more powerful but less safe than phenacetin.

Therapeutic Indications.

As an *analgesic* in headaches, neuralgias, rheumatism, sciatica, influenza, and dysmenorrhea.

As an *antipyretic* in influenza and simple febrile disorders.

As an *antispasmodic* in whooping-cough, chorea, and epilepsy.

As a *styptic* in nosebleed, coryza, hay-fever, hemorrhoids, and oozing from wounds.

Administration.—In acute febrile diseases if antipyrin be given after a cold bath the temperature will remain low for a considerable time. The action of antipyrin in susceptible persons should be guarded by a heart stimulant.

Pretoxic Signs.—Lethargy, tendency to sleep, and slow pulse-rate.

Toxicology.—In toxic doses antipyrin produces cyanosis, slow respirations, feeble pulse, vomiting, profuse sweating, and collapse.

Management.—Empty the stomach. Apply heat externally. Give oxygen and stimulate with alcohol, ammonia, digitalis, and strychnin.

APOMORPHIN HYDROCHLORATE

Derivation.—This salt is formed by heating morphin and hydrochloric acid in a sealed tube.

Properties.—It occurs in small gray crystals, without odor, and having a bitter taste. This salt turns

green on exposure to air and light. It is soluble in water (45 parts), alcohol (45 parts).

Dosage.— $\frac{1}{60}$ — $\frac{1}{8}$ grain.

Physiologic Action.

Emetic.—This drug acts as an emetic by stimulating the vomiting center in the medulla.

Expectorant.—Apomorphin to some extent increases the bronchial secretion.

Therapeutic Indications.

As an *emetic* apomorphin hydrochlorate is useful in cases of acute poisoning, especially in acute alcoholism.

As an *expectorant* it is used in acute bronchitis, laryngitis, and other catarrhal disorders of the bronchi and larynx. The author has found this drug of great value as an hypnotic in insomnia of chronic alcoholism.

Administration.—As an emetic, this drug is mostly given as a hypodermic injection in doses of $\frac{1}{20}$ — $\frac{1}{10}$ grain. As an expectorant, in doses varying from $\frac{1}{60}$ — $\frac{1}{20}$ grain. Children do not bear this drug well.

ARNICA (*)

ARSENIC COMPOUNDS

ARSENIC IODID

The action of this drug is about the same as that of arsenous acid.

Dosage.— $\frac{1}{60}$ — $\frac{1}{20}$ grain.

Preparation.

Solution of Arsenic and Mercury Iodids (Liquor Arseni et Hydrargyri Iodidi, or Donovan's Solution).—Dose, 1–10 minims.

ARSENIC TRIOXID

Synonyms.—Arsenous Acid, White Arsenic.

Properties.—It is a white, amorphous or crystalline salt, occurring as a powder or in lumps. It is soluble in water (80 parts), hydrochloric acid (6 parts), and nearly insoluble in alcohol.

Incompatibilities.—Tannic acid, iron salts, and magnesia.

Dosage.— $\frac{1}{60}$ – $\frac{1}{20}$ grain.

Preparations.

Solution of Arsenous Acid.—Dose, 1–10 minims.

Solution of Potassium Arsenite (Liquor Potassii Arsenitis, or Fowler's Solution).—Dose, 1–10 minims.

Physiologic Action.

Caustic.—Arsenic oxid applied externally produces a dissolution of tissue.

Gastro-intestinal Irritant.—This drug produces gastric irritation followed by nausea. In very small doses it acts as a gastric sedative.

Hematinic.—Arsenic has a beneficial action on the blood, increasing the number of red blood cells.

Nerve Sedative.—In small doses arsenic depresses nerve action, and in large doses causes paralysis.

Alterative.—Given internally, arsenic acts on the metabolic processes, causing a check of tissue changes, resulting in an increase in weight of the person. It also causes scaly conditions of the skin to disappear.

Therapeutic Indications.

As a *caustic* in treating warts, epitheliomata, lupus vulgaris, and corns.

As a *gastric sedative* in vomiting of pregnancy, and

especially for vomiting which occurs after a debauch. In gastrodynia and indigestion of the menopause it is useful.

As a *hematinic* in anemias, leukemia, and pseudo-leukemia.

As a *nerve sedative* in chorea, asthma, and neuralgia.

As an *alterative* in diabetes, leukemia, tuberculosis, malarial cachexia, chronic rheumatism, and dry, scaly diseases of the skin.

Administration.—Children bear arsenic preparations well. Always give this drug in well-diluted forms. Arsenic applied externally may give rise to toxic symptoms.

Pretoxic Signs.—Morning puffiness below the lower eyelids, slight looseness of the bowels, and vague abdominal pain or colic.

Toxicology.—*Acute poisoning* is characterized by nausea, vomiting, purging, abdominal pain, cold skin, small, feeble pulse, and collapse.

Management.—Wash out the stomach immediately. Give the antidote, hydrated iron with magnesia, or use magnesia, milk, white of egg. A good antidote is prepared by adding ammonia-water to the tincture of iron chlorid and strain, using the mass which remains in the strainer. Stimulate with alcohol, ammonia, and strychnin. Apply heat externally.

Chronic Poisoning.—The chief signs are anemia, loss of flesh, dyspepsia, cutaneous eruptions, and various paralyses due to neuritis.

Management.—Stop the drug. Aid elimination of the poison from the system by giving the iodids. Tone the muscles by means of electricity.

SODIUM ARSENATE

Action same as arsenous acid.

Dosage.— $\frac{1}{60}$ – $\frac{1}{20}$ grain.

Preparation.

Solution of Sodium Arsenate (Liquor Sodii Arseniatis, or Pearson's Solution).—Dose, 1–10 minims.

SODIUM CACODYLATE

This chemical is technically known as sodium dimethylarsenate. It is an arsenical derivative possessing less toxicity than the usual preparations of arsenic. Its uses are similar to those of arsenous acid. It is usually given hypodermically or even intravenously. It is indicated in anemias, psoriasis, leukemia, tuberculosis, syphilis, and chronic malarial cachexia.

Dosage.— $\frac{1}{2}$ to 2 grains.

ASAFETIDA (*)**ASPIDIUM (*)****BALSAM OF PERU (*)****BARIUM CHLORID (*)****BELLADONNA**

Derivation.—The leaves and roots of *Atropa Belladonna*.

Synonym.—Deadly Nightshade.

Constituent.—Atropin, an alkaloid.

Dosage.—1–5 grains.

Preparations.

Extract.—Dose, $\frac{1}{8}$ – $\frac{1}{2}$ grain.

Fluidextract.—Dose, $\frac{1}{2}$ –2 minims.

Liniment.—Apply locally.

Ointment contains 10 per cent. of the extract.

Plaster contains 0.4 per cent. of alkaloid.

Atropin.—Dose, $\frac{1}{120}$ – $\frac{1}{60}$ grain.

Atropin Sulphate.—Same dose as atropin.

Physiologic Action.

Analgesic.—Belladonna, applied locally or given internally, depresses the sensory nerve filaments, producing an anodyne effect.

Antispasmodic.—The motor nerves are slightly affected by this drug, causing a subsidence of muscular spasm.

Secretory Depressor.—Belladonna depresses the ends of the secretory nerves, decreasing the secretion of saliva, sweat, bronchial secretion, and the milk.

Cerebral Excitant.—This drug in moderate doses produces cerebral activity.

Cardiac Stimulant.—The heart's action is increased in rate and force by this drug.

Respiratory Stimulant.—Belladonna is a powerful respiratory stimulant.

Vasoconstrictor.—This drug primarily contracts the blood-vessels, but in larger doses causes them to dilate, producing a cutaneous flushing.

Mydriatic.—Belladonna, applied locally or given internally, produces dilatation of the pupils.

Therapeutic Indications.

As an *analgesic* in neuralgias, lumbago, pleurisy, and intercostal neuralgia.

As an *antispasmodic* in asthma, whooping-cough, laryngismus stridulus, dysmenorrhea, intestinal, hepatic, and renal colics, spasm of the bladder, and nocturnal incontinence of urine.

As a *secretory depressor* in night-sweats, diarrhea, galactorrhea, leukorrhea, and ptyalism.

As a *stimulant* in shock, collapse, pneumonia, and cardiac failure.

As a *mydriatic* in iritis and keratitis, but not in glaucoma.

Administration.—As a stimulant use atropin. For anodyne and antispasmodic effect on the bladder, it is best given in the form of a rectal suppository. To check the secretion of milk apply the ointment to the breasts. For asthma the inhalation of smoke from the burning leaves is best. Children bear belladonna well.

As an *antidote* atropin is much employed in poisoning by opium, physostigma, pilocarpin, chloral, chloroform, and prussic acid.

Pretoxic Signs.—Dryness of the mouth and throat, dilatation of the pupils, and a scarlet cutaneous eruption.

Toxicology.—Dry throat, dilated pupils, flushed face, rapid pulse, giddiness, delirium, blindness, and coma.

Management.—Empty and wash out the stomach. Give a solution of tannic acid. Stimulate with strong coffee enemata, strychnin, and ammonia. The physiological antidotes of belladonna are morphin, eserin, and pilocarpin.

BENZOIN COMPOUNDS

Derivation.—A balsamic resin from *Styrax Benzoin*.

Constituents.—Benzoic and cinnamic acids.

Preparations.

Benzoinated Lard.

Tincture.—Dose, 15–60 minims.

Compound Tincture (Friar's Balsam).—Dose, 15–60 minims.

Benzoic Acid.—Dose, 5–15 grains.

Ammonium Benzoate.—Dose, 5–15 grains.

Sodium Benzoate.—Dose, 5–60 grains.

Lithium Benzoate.—Dose, 5–20 grains.

Physiologic Action.

Antiseptic.—Benzoic acid is a strong antiseptic, a 1:1000 solution will inhibit the growth of bacteria. This drug is excreted by the urine as hippuric acid, and renders this fluid acid and slightly antiseptic.

Expectorant.—The drug is also partially excreted by the bronchial mucous membrane, and thus stimulates the secretion.

Antipyretic.—The benzoates will cause the fall of pyretic temperature.

Therapeutic Indications.

As an *antiseptic* in various forms of cystitis, gonorrhea, phosphaturia, and urinary incontinence.

As an *expectorant* in chronic bronchitis.

Administration.—The taste of the benzoates may be covered with the spirit of chloroform. Benzoin is much used as an inhalant in respiratory diseases by placing some of the tincture on boiling water, when the arising vapor will be charged with the drug.

BISMUTH COMPOUNDS**BISMUTH SALICYLATE**

Is a white, soft powder, insoluble in water and alcohol.

Other bismuth compounds are: Bismuth Benzoate, 5-15 grains; Bismuth Betanaphtholate, 5-15 grains; Bismuth Nitrate, 1-5 grains; Bismuth and Ammonium Citrate, 2-5 grains.

Physiologic Action.

Astringent.—Bismuth preparations have a slight astringent action externally and in the gastro-intestinal tract.

Antiseptic.—They are also slightly antiseptic in the intestines.

Therapeutic Indications.

As an *astringent* and *antiseptic* in skin diseases, wounds, and ulcers. In diarrhea, typhoid fever, gastric ulcer, vomiting, and gastric fermentation.

Toxicology.—Stomatitis, nausea, vomiting, diarrhea, and tendency to formation of ulcers in the mouth may follow toxic doses of bismuth preparations.

Management.—Give tannin or gallic acid.

BISMUTH SUBCARBONATE

This is a white, insoluble powder, without odor or taste.

Dosage.—5-30 grains.

BISMUTH SUBGALLATE

This preparation is also known as dermatol, and is a yellow, insoluble powder, without odor or taste.

Dosage.—4-8 grains.

BISMUTH SUBNITRATE

A white, insoluble, odorless and tasteless powder.

Dosage.—5-40 grains.

BORIC ACID

Properties.—A white, odorless crystal or scale, soluble in water (25 parts), glycerin (10 parts), alcohol (15 parts).

Synonym.—Boracic Acid.

Dosage.—5–15 grains.

Preparations.

Glycerite of Boroglycerin.—Also called Boroglycerid.

Sodium Borate (Borax or Biborate of Sodium) is soluble in water (16 parts), glycerin (1 part).

Dose 5–30 grains.

Physiologic Action.

Antiseptic.—Boric acid is a mild antiseptic, both externally and internally. Large doses retard digestion. Boric acid renders alkaline urine acid.

Therapeutic Indications.

Boric acid is used very extensively as a mild antiseptic in diseases of the eye, ear, nose, throat, and for washing out the bladder. It is also employed to a limited extent in dressing wounds and ulcers.

Internally it is used in fermentative dyspepsia and in cystitis of the ammoniacal type.

Borax is used the same as boric acid, and also in epilepsy.

BUCHU (*)

CACTUS (*)

CAFFEIN

Derivation.—An alkaloid derived from the common coffee berry, *Coffea Arabica*.

Synonyms.—Thein, Guaranin.

Properties.—A white, slender crystal, soluble in water (80 parts), alcohol (35 parts), ether (550 parts).

Dosage.— $\frac{1}{2}$ –5 grains.

Preparations.

Citrated Caffein.—Dose, 2–10 grains.

Caffein Hydrobromate.—Dose, $\frac{1}{2}$ –2 grains.

Caffein and Sodium Benzoate.—Dose, 2–10 grains.

Caffein and Sodium Salicylate.—Dose, 2–10 grains.

Physiologic Action.

Cardiac Stimulant.—Caffein produces a rapid and forcible heart action.

Cerebral Excitant.—Caffein causes an increase of intellection and rapidity of thought. The memory is cleared. Nervousness often follows the excessive use of coffee and tea.

Diuretic.—This drug increases the blood supply to the kidneys and stimulates the renal cells, thus causing an increase in the flow of urine.

Therapeutic Indications.

As a *cardiac stimulant* in organic heart disease, palpitation due to the excessive use of tobacco, and in the cardiac depression of pneumonia, shock, and acute diseases.

As a *diuretic* in renal and cardiac dropsy.

As a *cerebral excitant* in temporary mental or intellectual depression.

Administration.—A strong, black infusion of coffee is most excellent as a stimulant when given as an enema.

Pretoxic Signs.—Headache, restlessness, insomnia, and tremor.

Toxicology.—Caffein in toxic doses produces in-

somnia, giddiness, trembling, profuse urination, colic, rapid, feeble pulse, and collapse.

Management.—Empty the stomach, give tannic acid, and stimulate.

CALAMUS (*)

CALCIUM COMPOUNDS

CALCIUM BROMID

This salt has the same action and uses as potassium bromid, except that the calcium salt is not depressing to the heart.

Dosage.—5–20 grains.

CALCIUM CARBONATE

Synonym.—Chalk.

Preparations.

Prepared Chalk.—Dose, 10–60 grains.

Compound Chalk Powder.—Dose, 5–30 grains.

Chalk Mixture.—Dose, 1–4 drams.

Mercury and Chalk (Gray Powder).—Dose, 1–8 grains.

Physiologic Action.

Antacid.—Chalk preparations, when given internally, partially overcome the acidity of the gastric contents.

Astringent.—Both externally and internally chalk tends to dry up and lessen secretions.

Therapeutic Indications.

As an *antacid* in acid dyspepsia and gastric fermentation.

As an *astringent* it is used externally in moist eczema. Internally it is employed in diarrhea.

CALCIUM CHLORID

This salt, when applied externally or given internally, will relieve itching (antipruritic).

It is also useful in preventing hemorrhage in bleeders, and is much employed before operations on persons who are jaundiced and very liable to bleed profusely when cut.

Dosage.—5–20 grains.

CALCIUM GLYCERINOPHOSPHATE

(See *Phosphorus*)

CALCIUM HYPOPHOSPHITE

(See *Phosphorus*)

CALCIUM LACTATE

The lactate of lime has the general action of the lime salts, but, in addition, seems to have the added power of greatly increasing the coagulation of the blood. This particular action renders it useful in the control of bleeding. Given for a period before operations for hepatic diseases it seems to make hemorrhage less liable. In the treatment of urticaria the author has found it very valuable. The dose ranges from 3 to 8 grains.

CALCIUM OXID OR CALX

Synonyms.—Calx, Lime, Quicklime.

Preparations.

Lime-water (Liquor Calcis).—Dose, 1–4 ounces.

The action and use of lime-water is the same as that of chalk, as an antacid and astringent.

Syrup of Lime.—Dose, 20 minims.

Liniment (Carron Oil) consists of equal parts of lime-water and linseed oil. It is much used in the treatment of burns.

Chlorinated Lime (Calcium or Lime Hypochlorite, bleaching powder, but not Calcium Chlorid).—This preparation is a powerful oxidizing agent, and is much used as a disinfectant.

CALCIUM SULPHID

Synonyms.—Sulphurated Lime, Calx Sulphurata.

This preparation is much employed in averting pustular collections, as boils, carbuncles, and small abscesses.

Dosage.— $\frac{1}{10}$ – $\frac{1}{2}$ grain.

CALOMEL

(See *Mercury Compounds*)

CALUMBA (*)

CAMPHOR

Derivation.—A stearopten obtained from *Camphora Cinnamomum*.

Synonyms.—Camphora, Gum Camphor.

Properties.—It is soluble in water (1000 parts), alcohol (1 part), olive oil (4 parts), turpentine (3 parts).

Incompatibilities.—Chloral, menthol, carbolic acid, salol, and salicylic acid.

Dosage.—2–5 grains.

Preparations.

Water.—Dose, $\frac{1}{4}$ –1 ounce.

Spirit.—Dose, 15–60 minims.

Liniment (Camphorated Oil).—20 per cent. strength.

Cerate.—2 per cent. strength.

Camphor Monobromate.—Dose, 2-5 grains.

Camphoric Acid.—Dose, 10-20 grains.

Physiologic Action.

Antipruritic.—Applied externally camphor relieves itching.

Carminative.—Internally the drug stimulates the gastro-intestinal walls, causing the expulsion of flatus.

Cardiac Stimulant.—Reflexly from the stomach, and by its action directly upon the heart, camphor increases the heart's power.

Nerve Sedative.—In small doses this drug quiets the cerebrospinal centers.

Diaphoretic.—Camphor, being partially eliminated by the skin, increases the excretion of sweat.

Therapeutic Indications.

As an *antipruritic* in skin diseases and diabetic pruritis.

As a *carminative* in intestinal flatulence, spasmodic colic, and diarrhea.

As a *nerve sedative* and antispasmodic in hysteria, nervousness, dysmenorrhea, hiccough, headache, and asthma.

As a *cardiac stimulant* in the transient heart depression of the acute fevers and in shock.

As a *diaphoretic* in "breaking up colds."

Camphoric acid is employed in checking the night-sweats of tuberculosis.

Administration.—As a rapid heart stimulant camphor may be given hypodermically in a solution with

sterile olive oil, using 10 drops of a 10 per cent. solution.

Toxicology.—Large doses of camphor cause giddiness, fatigue, rapid, weak pulse, headache, vertigo, delirium, and convulsions.

Management.—Empty the stomach and stimulate with alcohol, ether, or strychnin.

CANNABIS INDICA

Derivation.—The flowering tops of the female plant.

Synonym.—Indian Hemp.

Incompatibilities.—Water precipitates the resin of the liquid preparations.

Dosage.—2–5 grains.

Preparations.

Extract.—Dose, $\frac{1}{8}$ –1 grain.

Fluidextract.—Dose, 2–5 minims.

Tincture.—Dose, 5–20 minims.

Cannabin Tannate.—Dose, 1–10 grains.

Physiologic Action.

Narcotic.—This drug causes great exhilaration, intoxication, and delirium, followed by prolonged and deep sleep.

Sedative.—In small doses it produces quietude and composure and relieves pain.

Therapeutic Indications.

As a *sedative* in chorea, hysteria, insanity, and delirium tremens.

As an *analgesic* in headache, neuralgia, gout, gastralgia, gonorrhea, and dysmenorrhea.

Toxicology.—Although this drug may cause pronounced symptoms, yet it very seldom proves fatal.

CANTHARIDES (*)

CAPSICUM

Derivation.—The fruit of *Fastigiatum Capsicum*.

Synonyms.—Cayenne Pepper, Red Pepper.

Dosage.—1-5 grains.

Preparations.

Fluidextract.—Dose, 1-5 minims.

Tincture.—Dose, 15-30 minims.

Plaster.

Oleoresin.—Dose, $\frac{1}{4}$ -1 grain.

Physiologic Action.

Rubefacient.—Applied externally the drug causes a burning sensation, with reddening of the surface.

Carminative.—In the stomach, capsicum produces a sensation of heat and an increase of the gastric secretion, and aids in the expulsion of gas.

Therapeutic Indications.

As a *rubefacient* in rheumatism, lumbago, neuralgia, and abdominal colic.

As a *carminative* and stomachic in flatulent dyspepsia, colic, alcoholic gastritis, atony of the stomach, and diarrhea.

CARBOLIC ACID

Properties.—It is a colorless, crystalline mass, with an aromatic odor and a burning, sweet taste.

Synonyms.—Phenol, Phenic Acid, Phenyl Alcohol.

Preparations.

Glycerite.—Dose, 2-5 minims.

Ointment.—5 per cent. strength.

Physiologic Action.

Antiseptic.—Carbolic acid is a strong and efficient antiseptic.

Anesthetic.—Applied to the skin carbolic acid causes a blanching of the surface, followed by numbness or anesthesia. Prolonged action produces a destruction of tissue (caustic).

Cardiac and Respiratory Depressant.—This drug in large doses paralyzes both of these vital functions.

Gastric Sedative.—In very minute doses carbolic acid, by its local action, quiets the stomach.

Renal Irritant.—The drug is excreted by the kidneys and is very irritating to these organs, often causing urinary suppression.

Therapeutic Indications.

As an *antiseptic* it is extensively used in surgery for many purposes: sterilizing instruments, dressing wounds, and irrigating cavities.

As a *gastric sedative* and *antiseptic* in persistent vomiting, flatulent dyspepsia, diarrhea, and fermentative gastritis.

As an *anesthetic* in toothache and itching of the skin.

Toxicology.—When applied locally in weak solution toxic symptoms often follow the use of this drug. Toxic signs are vomiting, diarrhea, colic, dark-colored urine, cold, moist skin, rapid, feeble pulse, convulsions, and collapse. Gangrene has followed the local use of a 1 : 20 solution.

Management.—Do not use emetics if there is reason to believe that the gastric mucous membrane is injured. Give antidotes, as magnesium sulphate (Epsom Salt), whisky, and white of egg or milk. Stimulate with whisky, strychnin, and digitalis. Apply heat externally.

CARBON

Synonyms.—Carbo, Charcoal.

Preparations.

Wood Charcoal (Carbo Ligni).—Dose, 10–60 grains.

Animal or Bone Charcoal (Carbo Animalis).—
Dose, 10–60 grains.

Physiologic Action.

Deodorant.—On account of its great absorbing power, charcoal frees substances of ill odors. It is used externally and internally.

Therapeutic Indications.

Externally it is used as an applicant to putrid ulcers and foul-smelling wounds, which it will soon rid of their odor. It is used in the form of a poultice.

Internally it is employed in acid gastric fermentation, dyspepsia, diarrhea, and as an antidote to poisoning by opium and nux vomica.

CARAWAY (*)**CARDAMOM (*)****CARYOPHYLLUS (*)****CASCARA SAGRADA**

Derivation.—The bark of *Rhamnus Purshiana*.

Constituent.—Cascarin, a glucosid.

Dosage.—15–30 grains.

Preparations.

Extract.—Dose, 1–6 grains.

Fluidextract.—Dose, 15–60 minims.

Cascarin (Resinoid).—Dose, $\frac{1}{4}$ –1 grain.

Action and Uses.

Cascara when taken internally acts as a tonic to

the intestinal walls and produces normal bowel movements.

It is much employed in chronic constipation. The dose may be gradually decreased in size and frequency and still bring about the desired action. This property makes cascara a most valuable drug, not only for the relief but for the cure of constipation. The objection to the use of the fluidextract is its intense bitterness.

CASCARILLA (*)

CASTOR OIL

Derivation.—A fixed oil expressed from the seeds or beans of *Ricinus Communis*.

Synonym.—Oleum Ricini.

Dosage.—1 dram to 2 ounces.

Physiologic Action.

Cathartic.—Castor oil produces soft movements of the bowels in about five hours. Its action is non-irritating and unattended, as a rule, by griping, but is followed by constipation.

Galactagogue.—Applied locally to the breasts in the form of the leaves or given internally as a fluidextract (unofficial) it produces an increase in the flow of milk.

Therapeutic Indications.

As a *cathartic* whenever it is necessary to move the bowels thoroughly with a period of rest following, as in diarrhea due to the presence of irritating material in the intestines. It is also used in the beginning of acute fevers, as pneumonia, typhoid, and scarlet fevers. Castor oil should not be employed in the treatment of chronic constipation.

As a *galactagogue*, see under Physiologic Action.

Administration.—Owing to its disagreeable taste it is difficult to administer this drug to many persons. To overcome this, adults may take the drug in capsules, or its taste can be disguised by mixing it with equal parts of glycerin and adding a few drops of oil of peppermint, wintergreen, or lemon-juice. Castor oil given to pregnant women may stimulate the uterine pains and cause a premature delivery. A drop or two of laudanum may be added to the oil to prevent griping.

CATECHU (*)

CAULOPHYLLUM (*)

CERIUM OXALATE (*)

CHENOPODIUM (*)

CHLORAL HYDRATE

Properties.—It is a colorless crystal or crust with a penetrating, sickening odor and an acrid taste. It is soluble in water (1 part), alcohol (freely).

Incompatibilities.—Alkalies, camphor and menthol.

Dosage.—5–20 grains.

Physiologic Action.

Hypnotic.—Taken in medicinal doses chloral produces general quietude, followed by placid, natural sleep.

Cardiac Depressor.—Chloral in large doses depresses the heart's action, causing a feeble, irregular pulse.

Therapeutic Indications.

The chief use of chloral is as a *sleep producer* in

cases where pain is not a prominent symptom, as in nervous insomnia. As an *antispasmodic* it is much used in delirium tremens, convulsions, strychnin-poisoning, chorea, asthma, puerperal eclampsia, and hiccoughs.

Administration.—Great care must be taken in giving chloral to patients with heart weakness. In insomnia accompanied by pain if a small dose of morphin be given with the chloral most satisfactory results will be obtained.

Toxicology.—Large doses of chloral cause a slow, feeble, irregular pulse, cold and cyanotic skin, slow, shallow respirations, deep sleep, and coma.

Management.—Empty and wash the stomach. Give antidotes, as cocain, inhalations of amyl nitrite, strychnin, and oxygen. Apply heat externally. Enemata of strong black coffee are useful.

CHLORALAMID (*)

CHLORALOSE (*)

CHLOROFORM

Derivation.—A liquid derived from the action of alcohol on chlorinated lime.

Properties.—A clear, colorless, volatile liquid with a sweet taste and an agreeable ethereal odor.

Preparations.

Water.—Dose, 1–8 drams.

Spirit.—Dose, 15–60 minims.

Liniment.

Emulsion.—Dose, 1–2 drams.

Physiologic Action.

Rubefacient.—When applied externally chloroform

causes a burning sensation, followed by redness of the surface and numbness.

Stomachic.—In the stomach the drug produces a sensation of warmth and an increase of the gastric secretion.

Anesthetic.—Given by inhalation chloroform soon causes a loss of consciousness, feeling, and reflexes.

Cardiorespiratory Depressant.—This drug in excess depresses and, later, paralyzes the two great centers of cardiac and respiratory functions.

Antiseptic.—Chloroform is an antiseptic and preservative of much value.

Therapeutic Indications,

As a *rubefacient* and anodyne it enters largely into the treatment of neuralgias, rheumatism, lumbago, sciatica, and cramps, being used for this purpose chiefly as a liniment.

As a *gastro-intestinal stimulant* it is much employed in flatulence and colic.

As an *antispasmodic* it is valuable in convulsions, hysteria, hiccough, eclampsia, epileptic seizures, chiefly employed by inhalation.

As an *anesthetic* in surgical procedures.

As an *antiseptic* it is chiefly used to prevent organic liquids from decomposing.

It is highly praised as a cure for tapeworm.

Toxicology.—The pupils, which are first contracted, dilate widely, reflexes are lost, the pulse becomes rapid and feeble, muscular relaxation is complete, and the breathing stertorous.

Management.—Stimulate with amyl nitrite, atropin, strychnin, and digitalis. Apply artificial respiration

and make rhythmic traction on the tongue. Give inhalations of oxygen and apply the faradic current.

CHRYSAROBIN (*)

CIMICIFUGA (*)

CINCHONA

Derivation.—The bark of *Cinchona Calisaya*.

Synonyms.—Calisaya, Peruvian Bark.

Constituents.—Quinin, cinchonin, quinidin, cinchonidin, and cinchotannic acid.

Incompatibilities.—Metallic salts, lime-water, and tartar emetic.

Dosage.—5–15 grains.

Preparations.

Extract.—Dose, 5–30 grains.

Fluidextract.—Dose, 5–60 minims.

Tincture.—Dose, $\frac{1}{2}$ –2 drams.

Infusion.—Dose, 2–8 drams.

Quinin.—Dose, $\frac{1}{2}$ –15 grains.

Quinin Arsenate.—Dose, $\frac{1}{16}$ – $\frac{1}{8}$ grain.

Quinin Bisulphate.—Dose, $\frac{1}{2}$ –20 grains.

Quinin Hydrobromate.—Dose, $\frac{1}{2}$ –20 grains.

Quinin Hydrochlorate.—Dose, $\frac{1}{2}$ –20 grains.

Quinin Salicylate.—Dose, 2–15 grains.

Quinin Sulphate.— $\frac{1}{2}$ –20 grains.

Quinin Tannate.—Dose, $\frac{1}{2}$ –15 grains.

Cinchonidin.—Dose, 1–20 grains.

Cinchonidin Salicylate.—Dose, 1–10 grains.

Cinchonidin Sulphate.—Dose, 1–20 grains.

Physiologic Action.

Stomachic.—Cinchona stimulates the flow of gastric juice, increases the appetite, and aids digestion.

Antiperiodic.—This drug prevents the return of periodic symptoms of malaria by its action on the plasmodia circulating in the blood.

Cerebral Excitant.—Quinin produces cerebral congestion and stimulation.

Spinal Depressant.—Quinin acts as a depressant to the spinal cord and lessens reflex action.

Cardiac Stimulant.—Cinchona in small doses increases the heart's action.

Antipyretic.—Quinin produces a fall of body temperature when given in febrile conditions.

Ecbolic.—In some pregnant women quinin will stimulate uterine contractions.

Therapeutic Indications.

As a *stomachic* in convalescence, atonic dyspepsia, loss of appetite, and anemia.

As an *antiperiodic* in all malarial affections.

As an *antipyretic* in pneumonia, influenza, rheumatism, and other febrile disorders.

Quinin has been found of great value in the treatment of whooping-cough.

Administration.—In malaria, quinin should be given in large doses some time before the expected paroxysm, or it may be used in moderate doses during the entire twenty-four hours before the attack. Persons going to malarial districts should take quinin in small doses as a prophylactic. If a cathartic be first given the action of the quinin is greatly augmented. Quinin should be given in powder form in capsules or konseals and not in pilular or tablet form, for if

these latter are not recently made their action is uncertain.

Pretoxic Signs.—Ringing or buzzing in the ears, fulness of the head, and slight deafness.

Toxicology.—The toxic symptoms of poisoning by quinin or cinchona are grouped as *cinchonism*: deafness, blindness, tinnitus aurium, skin eruptions, slow pulse, and coma.

CINNAMON (*)

CITRIC ACID (*)

COCA

Derivation.—The leaves of *Coca Erythroxylon*.

Synonyms.—Cuca, Erythroxylon.

Constituent.—Cocain, an alkaloid.

Dosage.—5–30 grains.

Preparations.

Fluidextract.—Dose, 1–4 drams.

Cocain Hydrochlorate.—Dose, $\frac{1}{4}$ –2 grains.

Physiologic Action.

Anesthetic.—Cocain, when applied to the mucous membrane, the broken skin, or injected subcutaneously, produces numbness of the parts with a blanching of the surface, due to the constriction of the blood-vessels.

Cerebrospinal Stimulant.—When given in moderate doses coca produces a sense of exhilaration, increases the mental powers, and causes insomnia.

Cardiac Stimulant.—In small doses this drug acts as a heart stimulant.

Mydriatic.—Applied to the conjunctiva, cocain soon produces marked dilatation of the pupils.

Therapeutic Indications.

As a *local anesthetic* in minor operations and in the relief of pruritus, toothache, painful ulcers, sore gums, and in vomiting.

As a *cerebrospinal stimulant* in melancholia, neurasthenia, and hysteria.

As a *mydriatic* in iritis and keratitis.

Administration.—As a subcutaneous injection cocaine may be employed as a 1 to 10 per cent. solution, and not more than $\frac{3}{4}$ grain should be used.

Toxicology.—Cocain should be used as an anesthetic with great caution, as it may produce grave toxic symptoms, as uncontrollable laughter followed by mental depression, dryness of the throat, nausea and vomiting, dilated pupils, feeble, irregular pulse, cyanosis, fainting, and collapse.

Management.—Wash out the stomach. Give stimulants, as strychnin and aromatic spirit of ammonia. Begin artificial respiration early and give inhalations of oxygen.

CODEIN

(See *Opium*)

COD-LIVER OIL

Derivation.—A fixed oil derived from the fresh livers of the *Gadus Morrhua* or the codfish.

Synonym.—Oleum Morrhue.

Dosage.—1–4 drams.

Preparation.

Emulsion.—Dose, 1–8 drams.

Physiologic Action.

Alterative.—Taken internally, cod-liver oil so affects

metabolic processes that the general nutrition of the body is improved, the resistance of the person is increased, and adipose tissue is deposited. Part of this action is due to its oily properties, and partly to certain extractives found in the drug.

Therapeutic Indications.

Cod-liver oil is employed in all conditions accompanied by failure of the general nutrition of the body, as in tuberculosis, scrofula, diabetes, chronic bronchial affections, anemia, rickets, syphilis, neurasthenia, and chronic rheumatism.

Administration.—The clear oil is the best form for giving this drug, but its taste to many individuals is revolting. Children learn to take it readily. It may be given in capsules or mixed with glycerin and a few drops of oil of wintergreen. If a little salt be added to the oil, regurgitation may be prevented.

COLCHICUM

Derivation.—The corm and seed of *Colchicum Autumnale*.

Synonym.—Meadow Saffron.

Constituent.—Colchicin.

Dosage.—1–5 grains.

Preparations.

Extract of the Root.—Dose, $\frac{1}{2}$ –2 grains.

Fluidextract of the Root.—Dose, 2–8 minims.

Fluidextract of the Seeds.—Dose, 3–10 minims.

Tincture of the Seeds.—Dose, 5–30 minims.

Wine of the Root.—Dose, 5–20 minims.

Wine of the Seeds.—Dose, 20–60 minims.

Colchicin.—Dose, $\frac{1}{120}$ – $\frac{1}{30}$ grain.

Physiologic Action.

Irritant.—Applied externally, colchicum causes burning and redness, and if the action continues pustules form.

Gastro-intestinal Irritant.—In very small doses the drug stimulates the gastric, intestinal, and biliary secretions, but in larger doses it acts as an irritant, producing nausea, vomiting, colic, and purging.

Cardiorespiratory Depressant.—Colchicum acts on the heart similarly to aconite, producing a slow, soft pulse. Respirations are first slowed, but later become rapid and shallow.

Antipodagric.—The chief use of colchicum is in gout. How its action is brought about in this disease little is known, but it soon lessens the pain and joint symptoms.

Therapeutic Indications.

As mentioned above, colchicum is chiefly employed in the treatment of podagra (gout). It is also useful in chronic rheumatism.

Toxicology.—Large doses produce vomiting, purging (which may become bloody), rapid, feeble pulse, shallow respirations, most intense colic, cold, moist skin, and collapse.

Management.—Empty the stomach by giving apomorphin or emetics, as mustard- or salt-water. Tannic acid is an excellent antidote. Stimulate with enemata of strong coffee, strychnin, and atropin.

COLOCYNTH (*)

CONIUM (*)

CONVALLARIA

Derivation.—The rhizomes and roots of *Convallaria Majalis*.

Synonym.—Lily of the Valley.

Dosage.—1–5 grains.

Preparations.

Fluidextract.—Dose, 5–20 minims.

Convallamarin.—Dose, $\frac{1}{2}$ –1 grain.

Physiologic Action.

Cardiac Stimulant.—Convallaria produces a slow, powerful heart action, and is said to act especially on the right side of the heart.

Diuretic.—The use of convallaria is followed by an increase of the urinary excretion.

Comparative Action.—Compared to digitalis, convallaria is not so energetic, produces less slowing of the heart, does not cause so great vasoconstriction, and acts especially on the right heart.

Therapeutic Indications.

It is used in cardiac disease as is digitalis, for which it may be substituted.

COPAIBA (*)

COPPER COMPOUNDS (*)

COTARNIN HYDROCHLORATE

(See Part IV.)

CREOLIN (*)

CREOSOTE AND COMPOUNDS

Derivation.—Creosote is an oily liquid derived from the distillation of beech-wood.

Properties.—It is a colorless liquid with an empyreumatic odor and a burning taste. It is soluble in water (150 parts), alcohol (freely).

Constituents.—Guaiacol and Creosol.

Dosage.— $\frac{1}{2}$ –2 minims.

Preparations.

Water.—Dose, 1–2 drams.

Creosote Carbonate (Creosotal).—Dose, 5–20 minims.

Physiologic Action.

The action of this drug is very much like that of Carbolic Acid (which see).

Locally it is an *anesthetic* and *parasiticide*. Internally it is an *antiseptic* and *gastric sedative*.

Therapeutic Indications.

The chief use of creosote is in pulmonary tuberculosis, when it acts as an *antiseptic* and increases the nutrition. It is also much employed as an *intestinal antiseptic* in typhoid fever and diarrhea. In vomiting it is very useful.

Creosote carbonate is less irritating than creosote, and is extensively employed in tuberculosis, pneumonia, and typhoid fever.

Administration.—As creosote is more or less of a gastric irritant, it is best given in capsules or in the form of an emulsion. Creosote is much used as an inhalant, and as such may be given on a mask in the following combination: Chloroform, ether, and creosote, of each 1 dram; then add 2 drams of alcohol and 1 dram of the oil of eucalyptus. Sprinkle about 20 drops of this on the mask or inhaler.

Toxicology.—See under Carbolic Acid.

CROTON CHLORAL (*)

CROTON OIL

Derivation.—A fixed oil expressed from the seeds of *Croton Tiglium*.

Synonym.—Oleum Tiglii.

Dosage.— $\frac{1}{4}$ –I minim.

Physiologic Action.

Rubefacient and Pustulant.—Applied externally croton oil produces great irritation and redness, soon followed by the formation of pustules.

Drastic Cathartic.—Taken internally the drug causes considerable irritation, with profuse and watery purgation. It may bring about a severe gastro-enteritis.

Therapeutic Indications.

As a *counter-irritant* in pleurisy, arthritis, bronchitis, and neuralgia.

As a *cathartic* when it is desirable to get rapid and profuse bowel movements, or for use in unconscious patients, as in apoplexy, mania, and coma.

Administration.—If the patient be unconscious 1 drop of croton oil may be mixed with a little butter or glycerin and placed on the base of the tongue. It should never be given to patients suffering with inflammation of the stomach, intestines, or peritoneum. This potent drug should not be administered to children or pregnant women. Not more than 2 drops should be given as a single dose.

Toxicology.—Nausea, vomiting, great purging, severe abdominal pain, followed by collapse.

Management.—Empty the stomach. Give demul-

cents, as mucilage, starch paste, oils, flaxseed-tea, and white of egg. Give opium for the pain. Stimulate with ammonia, brandy, and strychnin.

CUBEBS (*)

CUSSO (*)

DIGITALIS

Derivation.—The leaves of *Digitalis Purpurea*, collected in the second year.

Synonym.—Foxglove.

Constituents.—Digitalin, digitoxin, digitonin, and digitalein—all are glucosids.

Incompatibilities.—Acids, alkalies, tannin, cinchona, and iron and lead salts.

Dosage.—1–3 grains.

Preparations.

Extract.—Dose, $\frac{1}{4}$ –1 grain.

Fluidextract.—Dose, $\frac{1}{2}$ –3 minims.

Tincture.—Dose, 5–30 minims.

Infusion.—Dose, 1–4 drams.

Digitalin.—Dose, $\frac{1}{80}$ grain.

Physiologic Action.

Gastro-intestinal Irritant.—Digitalis disorders the stomach and causes nausea and vomiting in many persons.

Cardiac Stimulant.—Upon the heart digitalis acts as a stimulant. The heart action becomes slower, but more forcible.

Vasoconstrictor.—By its stimulating action on the vasomotor center of the brain, digitalis causes a

marked constriction of the blood-vessels and raises the general blood-pressure.

Diuretic.—By the combined action of this drug on the heart and vessels, together with its local action on the kidneys, the amount of urine excreted is greatly increased.

Therapeutic Indications.

As a *cardiac stimulant* in chronic endocarditis with involvement of any of the valves. In tachycardia, palpitation, and irritable heart it is useful. In heart depression, occurring in the course of typhoid fever, pneumonia, shock, drug poisoning, acute fevers, and alcoholism.

As a *diuretic* in dropsy of renal or cardiac origin.

Digitalis is also employed in exophthalmic goiter, menorrhagia, and hemorrhage.

Administration.—As digitalis easily disorders the stomach, it may be given to susceptible persons as an enema. As a heart stimulant use the tincture, and for diuretic effect the infusion is preferable. Fever prevents the slowing action of digitalis on the heart. Children bear digitalis badly. As it is often desirable to combine digitalis with iron, the black mixture resulting from such a combination may be readily cleared by adding a little dilute phosphoric acid.

Digitalis slowly accumulates in the system, and on this account the drug should be stopped occasionally.

Pretoxic Signs.—A slow pulse becoming rapid, and a decrease in the flow of urine.

Toxicology.—Large doses produce a rapid, tumultuous heart, nausea, vomiting, purging, headache, and, later, collapse.

Management.—Empty the stomach and wash repeatedly. Give tannin as an antidote. Stimulate with ammonia, brandy, strychnin, and atropin. Keep the patient in the reclining position. This is important.

ELATERIUM (*)

ERGOT

Derivation.—Ergot is produced by the action of a fungus on the grain of common rye.

Synonyms.—Spurred Rye, Ergot of Rye, Ergota.

Constituents.—Ergotin and Cornutin.

Dosage.—30–60 grains.

Preparations.

Extract.—Dose, 5–15 grains.

Fluidextract.—Dose, $\frac{1}{2}$ –2 drams.

Wine.—Dose, 1–4 drams.

Ergotin (pure aqueous extract).—Dose, 1–10 grains.

Physiologic Action.

Hemostatic.—Ergot given internally causes a general contraction of the blood-vessels and a rise of blood-pressure.

Oxytotic.—Ergot produces, by its action on the muscles of the uterus, great contraction of that organ.

Therapeutic Indications.

As a *hemostatic* in cerebral and spinal congestion, in post-partum hemorrhage, in hematuria, hemoptysis, hematemesis, and epistaxis; to check secretions in profuse sweating, in diarrhea, diabetes insipidus, and in excessive secretion of milk.

As a *uterine stimulant* in post-partum hemorrhage, subinvolution, and menorrhagia.

This drug is of value in chronic alcoholism and delirium tremens.

Toxicology.—*Acute Poisoning.*—Nausea, vomiting, diarrhea, slow pulse, dizziness, giddiness, tremor, disturbed vision, areas of numbness, subnormal temperature, and collapse.

Management.—Empty the stomach with mustard or apomorphin. Give tannin. Stimulate with brandy. Give inhalations of amyl nitrite and hypodermic injections of nitroglycerin.

Chronic Poisoning.—Headache, vertigo, drowsiness, itching, photophobia, spasms of the muscles, coldness and numbness of the fingers and toes, followed by dry gangrene.

ERIGERON (*)

ERIODICTYON (*)

ETHER

Derivation.—A liquid derived from the distillation of alcohol with sulphuric acid.

Synonyms.—Sulphuric Ether, Ethyl Oxid.

Properties.—A clear, volatile liquid with a sweet, burning taste and a characteristic odor.

Dosage.—5–60 minims.

Preparations.

Spirit.—Dose, 15–60 minims.

Compound Spirit (Hoffman's Anodyne).—Dose, 5–60 minims.

Physiologic Action.

Anesthetic.—Applied locally it produces great cold and numbness, due to its rapid evaporation.

Given by inhalation it soon causes unconsciousness, with loss of reflexes and sensation.

Cardiac Stimulant.—Ether rapidly produces a quick, forcible heart with an increase of blood-pressure.

Respiratory Stimulant.—Ether at first causes rapid and deep respirations.

Therapeutic Indications.

As an *anesthetic* in surgical procedure.

As an *antispasmodic* in tetanus, hysteric spasms, convulsions, eclampsia, hiccoughs, and asthma.

As a *stimulant* in syncope, shock, collapse, and heart depression occurring in the acute fevers.

Externally in neuralgias, toothache, and rheumatism.

Administration.—Ether, when given internally, should be employed in capsules or as a syrup.

Toxicology.—See Chloroform.

ETHYL BROMID (*)

ETHYL CHLORID (*)

EUCAIN (*)

EUCALYPTUS (*)

EUONYMUS (*)

EUPATORIUM (*)

FORMALDEHYD

Derivation.—A colorless gas derived from the action of heat on wood alcohol.

Synonyms.—Formic Aldehyd, Formol.

Preparations.

Formalin, which is a 40 per cent. solution of formaldehyd in water.

Physiologic Action.

Antiseptic.—This drug has great powers as an antiseptic and disinfectant. On account of its penetrating power it is most efficient.

Anhidrotic.—Applied externally, formalin soon hardens the skin and lessens sweating.

Therapeutic Indications.

As an *anhidrotic* for sweating feet or axillæ.

As an *antiseptic* for instruments, catheters, and for dressing wounds.

As a *disinfectant* for rooms, clothing, and furniture after contagious or infectious diseases.

As a *preservative* of anatomic and pathologic specimens.

FRANGULA (*)**GALLA**

Definition.—Nutmalls are excrescences on the oak, caused by the puncture and eggs of a small insect.

Synonyms.—Nutmalls, Galls.

Constituents.—Tannic and gallic acids.

Incompatibilities.—Alkalies, alkaloids, metallic salts, acids, and gelatin.

Preparations.—

Tincture of Nutgalls.—Dose, 1–2 drams.

Ointment of Nutgalls.—20 per cent. strength.

Tannic Acid (Tannin).—Dose, 1–5 grains.

Ointment of Tannic Acid.

Glycerite of Tannic Acid.

Styptic collodion contains 20 per cent. of tannic acid.

Gallic Acid.—Dose, 1–15 grains.

Physiologic Action.

Astringent.—Applied externally, tannic acid coagulates albuminous discharges, stops bleeding, and astringes the tissues. Internally, it acts as an astringent, diminishing the gastric and intestinal juices.

Gallic acid, on the other hand, does not coagulate albumin, but controls hemorrhage by constricting the blood-vessels.

Therapeutic Indications.

Tannic acid is used *locally* to stop bleeding; to contract relaxed tissues, as in rhinitis, pharyngitis, and uvulitis; to check excessive sweating of tuberculosis or localized sweating of the feet or axillæ. It is useful as an injection in leukorrhea.

Internally it is used in diarrhea, diabetes, and renal bleeding.

Gallic acid is given in the treatment of hematuria, menorrhagia, night-sweats, diabetes, albuminuria, and diarrhea.

GAULTHERIA

Derivation.—A volatile oil distilled from the leaves of *Gaultheria Procumbens*.

Synonyms.—Oil of Wintergreen, Oil of Teaberry.

Dosage.—5–20 minims.

Preparation.

Spirit.—Dose, 1–2 drams.

Physiologic Action.

The action and uses of the oil of wintergreen are the same as those of Salicylic Acid (which see).

Administration.—It is best given in capsules, as an emulsion, or on sugar. There is on the market a syn-

thetic oil of wintergreen made from carbolic acid derivatives and called methyl salicylate. This preparation should not be employed internally as a substitute for the natural oil.

GELSEMIUM

Derivation.—The rhizomes of *Gelsemium Semper-virens*.

Synonym.—Yellow Jasmine.

Constituents.—Gelsemin and Gelseminin.

Dosage.—3–10 grains.

Preparations.

Fluidextract.—Dose, 2–5 minims.

Tincture.—Dose, 10–30 minims.

Gelsemin.—Dose, $\frac{1}{120}$ — $\frac{1}{60}$ grain.

Physiologic Action.

Spinal Depressant.—Gelsemium acts mainly on the anterior horn of the cord, depressing it, thus causing loss of reflexes and decreased muscular power. The sensory side is also affected, producing anesthesia.

Mydriatic.—This drug produces dilatation of the pupils.

Gelsemium is a cardiorespiratory depressant.

Therapeutic Indications.

As an *antispasmodic* in whooping-cough, asthma, and spasmodic dysmenorrhea.

As an *analgesic* in neuralgia, rheumatism, headache, and migraine.

Administration.—As a mydriatic gelsemin is used in a 1 : 60 solution in water.

Toxicology.—Large doses produce languor, malaise, and weakness, followed by muscular relaxation, as

ptosis and dropping of the jaw. The pupils are widely dilated, the pulse rapid, feeble, and irregular, and the skin cold and moist.

Management.—Empty the stomach with emetics, as mustard-, salt-water, or apomorphin. Give tannic acid. Stimulate with ammonia, atropin, and strychnin.

GENTIAN

Derivation.—The roots of *Gentiana Lutea*.

Incompatibilities.—Iron and lead salts.

Dosage.—5–30 grains.

Preparations.

Extract.—Dose, 1–10 grains.

Fluidextract.—Dose, 5–30 minims.

Compound Tincture.—Dose, 1–4 drams.

Physiologic Action.

Stomachic.—In medicinal doses gentian sharpens the appetite, increases the flow of the gastric secretions, and the motor power of the stomach and intestines.

Therapeutic Indications.

Gentian is employed whenever a bitter tonic is necessary, as in anorexia, atonic dyspepsia, hysteria, anemia, etc.

GINGER

Derivation.—The rhizomes of *Zingiber Officinale*.

Synonym.—Zingiber.

Dosage.—5–15 grains.

Preparation.

Fluidextract.—Dose, 5–15 minims.

Tincture.—Dose, 10–60 minims.

Syrup.—Dose, 1-4 drams.

Oleoresin.—Dose, $\frac{1}{2}$ -2 minims.

Physiologic Action.

Rubefacient.—Applied externally ginger produces aburning sensation, followed by redness of the surface.

Stomachic.—Ginger increases the flow of saliva and gastric juice and stimulates the appetite.

Carminative.—By its stimulating action on the motor power of the stomach and intestines it aids in the expulsion of gas or flatus.

Therapeutic Indications.

Ginger is used in dyspepsia, flatulence, colic, diarrhea, and dysmenorrhea. Externally it is used the same as capsicum.

GLYCERIN

Derivation.—It is a triatomic alcohol, derived from the action of superheated steam on fats.

Properties.—Glycerin is a clear, colorless, thick syrupy liquid with a sweet, warm taste.

Dosage.—5-60 minims.

Preparations.

Suppositories.

Several glycerites.

Physiologic Action.

Emollient.—Applied externally glycerin is soothing and softens the skin, and will aid in the absorption of drugs incorporated with it.

Laxative.—Given internally it produces a soft bowel movement. If given by rectum it has the same action.

Therapeutic Indications.

Externally for chapped hands, eczema, psoriasis, and other skin diseases.

Internally it is used in constipation, either by mouth or rectum.

Glycerin is also employed as a sweetening agent for diabetics.

GLYCYRRHIZA

Derivation.—The root of *Glycyrrhiza Glabra*.

Synonyms.—Liquorice, Licorice.

Constituent.—Glycyrrhizin.

Dosage.—Freely.

Preparations.

Extract.—Dose, 5–60 grains.

Fluidextract.—Dose, 1–2 drams.

Compound Powder contains senna, licorice, sulphur, and oil of fennel. Dose, 1–2 drams.

Compound Mixture contains licorice, paregoric, wine of antimony, and spirit of nitrous ether.

It is also known as Brown Mixture. Dose, 1–4 drams.

Ammoniated Glycyrrhizin.—Dose, 5–15 grains.

Physiologic Action.

Demulcent.—Licorice allays irritation of the mouth, pharynx, and bowels.

Laxative.—Licorice is a slight laxative, causing a large, softened stool.

Vehicle.—Owing to its pleasant taste, licorice is much employed to cover the taste of unpleasant drugs.

Therapeutic Indications.

As a *demulcent* in stomatitis and pharyngitis.

As a *laxative* it is given in the form of the compound powder, as a mild, non-gripping laxative.

GOSSYPII RADICIS CORTEX (*)

GRINDELIA ROBUSTA (*)

GUAIAAC (*)

GUAIACOL

Derivation.—One of the chief constituents of Creosote.

Properties.—It is a colorless, oily liquid with an empyreumatic odor. It is soluble in alcohol and ether (freely), in water (100 parts).

Dosage.— $\frac{1}{2}$ –10 minims.

Preparations.

Guaiacol Benzoate (Benzosol).—Dose, 1–10 grains.

Guaiacol Carbonate (Duotal).—Dose, 1–8 grains.

Guaiacol Salicylate.—Dose, 5–30 grains.

Guaiacol Valerianate (Geosote).—Dose, 3–10 minims.

Physiologic Action.

The general action of guaiacol is the same as that of Creosote (which see), excepting that guaiacol has a powerful antipyretic action when applied locally. At times it reduces the temperature from five to seven degrees in a brief time.

Guaiacol carbonate is much employed as an internal antiseptic.

Therapeutic Indications.

They are the same as for creosote, but the carbonate is much used in pulmonary tuberculosis, typhoid fever, and diarrhea as an antiseptic.

Administration.—Guaiacol should be given well diluted and its taste disguised by some vehicle or in capsules.

Locally, for reducing fever, it must be used with great caution, as it may produce sudden collapse. Thirty minims of the pure drug mixed with equal parts of glycerin are applied to the skin of the abdomen or chest by means of a camel's-hair brush, and the area covered with oiled muslin to prevent too rapid evaporation.

Applied to painful areas, as in neuralgia, rheumatism, and sciatica, guaiacol rapidly relieves the pain.

HAMAMELIS (*)

HEMATOXYLON (*)

HEROIN (See *Opium*)

HIRUDO

Definition.—An aquatic worm of the class *Sanguisuga Medicinalis*.

Synonym.—Leech.

Therapeutic Use.

The leech is employed to abstract blood in such conditions as meningitis, mastoiditis, conjunctival ecchymosis, orchitis, and joint affections.

Application.

Have the area shaven and well cleaned, and apply the leech. If the leech does not readily take hold, then apply to the part a little fresh milk or blood. If it is desirable to have the animal attack a certain spot,

then place the leech on a sheet of paper with a small hole in it, and have this hole over the area you wish to have attacked.

The leech will release its hold when it is engorged with blood. If, for any reason, it holds fast when you desire to remove it or if it accidentally gets into the external auditory meatus, it may be readily removed by applying salt or a drop of ether to it.

If the leech-bite continues to bleed, the hemorrhage may be controlled by the application of pressure, styptic collodion, Monsel's solution, lunar caustic, or suprarenal extract.

HOMATROPIN HYDROBROMATE

Action and Uses.

This drug causes dilatation of the pupils, for which purpose it is solely employed.

Its general action is similar to atropin.

Used for the eye in a 1 per cent. solution.

HUMULUS (*)

HYDRASTIS

Derivation.—The rhizome and root of *Hydrastis Canadensis*.

Synonym.—Golden Seal, Yellow Root.

Constituents.—Two alkaloids: Hydrastin and Berberin.

Dosage.—5–60 grains.

Preparations.

Fluidextract.—Dose, 5–60 minims.

Tincture.—Dose, $\frac{1}{2}$ –2 drams.

Glycerite.

Hydrastin.—Dose, $\frac{1}{4}$ –1 grain.

Hydrastinin Hydrochlorate (artificial alkaloid).—

Dose, $\frac{1}{4}$ – $\frac{1}{2}$ grain.

Physiologic Action.

Astringent.—Applied to the skin or mucous membrane it is soothing and astringent, lessening the secretions

Stomachic.—Internally it increases the gastric juice and sharpens the appetite.

Cholagogue.—This drug is said to increase the flow of bile.

Cardiorespiratory Stimulant.—This action of the drug is very similar to that of *nux vomica*.

Styptic.—*Hydrastis* contracts the musculature of the vessels, causing vasoconstriction.

Oxytocic.—*Hydrastis* causes contraction of the muscles of the uterus.

Therapeutic Indications.

As an *astringent* it is used in the treatment of ulcers, wounds, local sweating, stomatitis and pharyngitis, rhinitis, leukorrhea, and gonorrhea.

As a *stomachic* in atonic dyspepsia and alcoholic gastritis.

As a *cholagogue* in catarrhal jaundice.

As a *styptic* in epistaxis, hemoptysis, menorrhagia, and other forms of bleeding.

HYDROCHLORIC ACID

Definition.—A liquid containing about 32 per cent. of absolute hydrochloric acid.

Synonyms.—Muriatic Acid, Acidum Hydrochloricum.

Properties.—A clear, colorless liquid, giving off irritating vapors and having a burning, sour taste.

Incompatibilities.—Alkalies, carbonates, lead and silver salts, and potassium permanganate.

Dosage.—1–10 minims, well diluted.

Preparations.

Dilute Hydrochloric Acid (10 per cent. strength).—

Dose, 10–30 minims.

Physiologic Action.

Caustic.—Applied externally this acid, like all of the mineral acids, causes redness and burning, and if its action is continued, destruction of tissue takes place.

Tonic.—Hydrochloric acid increases the flow of saliva, but decreases the gastric juice if it be taken before or during the meal. If administered after the meal it reinforces the action of the natural acid of the stomach and aids digestion.

Hematinic.—This acid is said to increase the number of red cells of the blood.

Therapeutic Indications.

Hydrochloric acid is useful in all diseases in which the natural acid is deficient, as in nervous dyspepsia, subacid indigestion, achylia, gastric cancer, anemia, and acute fevers, especially typhoid fever.

Administration.—This acid should always be given in a well-diluted form and after meals. If taken through a glass tube its corrosive action on the teeth may be avoided.

Toxicology.—The usual symptoms are burning of the mouth, throat, and stomach; excoriation of the lips, tongue, and mouth; vomiting of dark-colored

material (altered blood); cold, moist skin; rapid, feeble pulse, and collapse.

Management.—Do not use a stomach-tube if a strong acid has been taken, as you may start a severe hemorrhage or perforate the stomach wall. Give antidotes, as soapy water, lime-water, chalk, or saleratus-water. Give demulcents, as olive oil, cotton-seed oil, milk, white of egg, and starch solution. Give morphin for pain and stimulate if necessary.

HYDROCYANIC ACID

Definition.—It is a colorless, clear liquid, with an odor resembling bitter almonds, and is extremely poisonous. One drop of pure acid has caused death.

Synonym.—Prussic Acid.

Preparations.

Dilute Hydrocyanic Acid contains 2 per cent. of hydrocyanic acid, and is the only form used as a medicine. Dose, 1–4 minims. When this solution turns brown it should not be used.

Physiologic Action.

Local Anodyne.—The dilute acid, when applied to the cutaneous surface, is rapidly absorbed and depresses the sensory end filaments, causing numbness.

Analgesic.—Taken internally the dilute acid acts as a sedative to the stomach walls. Being absorbed quickly, it acts upon the sensory nerve tissue, depressing it.

Cardiorespiratory Depressor.—Dilute prussic acid in small doses produces a slow heart; in large doses a rapid, feeble heart. The respiratory function is also depressed.

Therapeutic Indications.

As a *sedative* in the hacking cough of chronic bronchitis, pulmonary tuberculosis, and in whooping-cough. In persistent vomiting, colic, and gastralgia.

As a *local anodyne* in all forms of itching.

Toxicology.—Poisoning by this drug is very rapid. The symptoms are salivation, giddiness, cyanosis, convulsions, fixed, staring eyes, dilated pupils, very weak and rapid pulse, and, if fatal, death will take place in a short time.

Management.—Stimulate vigorously with ammonia inhalations, electricity, and atropin. Inaugurate artificial respiration and give cold affusions.

HYDROGEN PEROXID SOLUTION

Definition.—A 3 per cent. solution of hydrogen peroxid in water.

Synonyms.—Aqua Hydrogenii Dioxidii, Oxygenized Water.

Properties.—A clear, colorless liquid with a slight acid taste, and which in the presence of organic material easily gives up its oxygen.

Dosage.—1–2 drams.

Physiologic Action.

Disinfectant and Deodorizer.—As this preparation gives up its oxygen very readily, it oxidizes organic material with which it comes in contact, thus destroying pus, dead tissue, and micro-organisms (sic).

Therapeutic Indications.

Hydrogen peroxid is employed whenever it is desired to free tissues of pus and necrotic matter, as in ulcers, fistulous tracts, abscess cavities, and diphtheritic

patches. This drug is useful also in stopping the oozing of blood from wounds.

HYOSCYAMUS

Derivation.—The leaves and flowering tops of the second year's growth of *Hyoscyamus Niger*.

Synonym.—Henbane.

Constituents.—Two alkaloids: Hyoscyamin and Hyoscin.

Dosage.—5–15 grains.

Preparations.

Extract.—Dose, $\frac{1}{2}$ –3 grains.

Fluidextract.—Dose, 5–15 minims.

Tincture.—Dose, 1–4 drams.

Hyoscin Hydrobromate.—Dose, $\frac{1}{400}$ – $\frac{1}{120}$ grain.

Hyoscyamin (Amorphous).—Dose, $\frac{1}{12}$ – $\frac{1}{6}$ minim.

Hyoscyamin (Crystal).—Dose, $\frac{1}{120}$ – $\frac{1}{60}$ grain.

Physiologic Action.

The action of hyoscyamus is the same as that of belladonna, except that hyoscyamus has a *sedative* effect on the brain and cord due to the hyoscin, and hyoscyamus is more of a sedative to the bladder.

Therapeutic Indications.

This drug is much employed as a *sedative* in bladder troubles, as vesical spasm, cystitis, prostatitis, urethritis, and urinary incontinence.

Hyoscin is used in the insomnia and unrest of insanity, mania, and delirium tremens.

Toxicology.—See Belladonna.

ICHTHYOL

Derivation.—A substance produced by the distillation of the fossil remains of fish.

Synonym.—Ammonium Sulpho-ichthyolate.

Properties.—It is a semiliquid, dark brown or black substance, soluble in water, and having a rank bituminous odor.

Dosage.—3–15 minims.

Physiologic Action.

Vulnerary.—This agent, when applied to wounded areas, stimulates the formation of granulation tissue and the growth of epithelia.

Alterative.—Internally ichthyol seems to alter certain morbid processes and to exert a slight antiseptic effect.

Therapeutic Indications.

Externally in the treatment of ulcers, indolent wounds, erysipelas, burns, chilblains, and nearly all skin diseases.

Internally it is said to be useful in tuberculosis, as it decreases the expectoration and lessens the fever. It should be given in capsules.

INGLUVIN (*)

IODIN

Preparations.

Tincture.—Dose, 1–5 minims.

Ointment.

Compound Solution (Lugol's Solution) contains iodine, potassium iodide, and water. Dose, 1–10 minims.

Physiologic Action.

Counter-irritant.—Externally iodine produces great irritation, with burning and redness.

Parasiticide.—Iodin destroys the lower animal and vegetable parasites that attack the skin.

Therapeutic Indications.

Iodin is used in the various parasitic skin diseases and as an application to enlarged glands, sprained joints, and in pleurisy, pericarditis, rheumatism, and neuralgia.

It is very seldom used internally, but occasionally it will be found of great value if employed in minute doses in persistent vomiting.

Administration.—Rather than make frequent paintings of the part, it is better to at once paint the area until it is almost black and then wait until desquamation is complete before applying the iodine again. This prevents very much local irritation.

Toxicology.—Iodin applied is absorbed and may cause the appearance of toxic signs. Salivation, tenderness of the gums, nausea, coryza, acneal eruption, anemia, various paralyses, and emaciation. These symptoms are classed as *iodism*.

Management.—Discontinue the use of the drug. Aid in its elimination. If it be a case of acute poisoning, wash out the stomach, give starch solution, and wash out the viscous again. Repeat this several times. Stimulate with brandy and atropine. Apply heat to the body.

IODOFORM

Properties.—A yellow crystalline powder having a penetrating odor and a sweet taste. It is soluble in ether (7 parts), alcohol (52 parts), glycerin (100 parts), and insoluble in water. It contains about 95 per cent. of iodine.

Dosage.—1–3 grains.

Preparation.*Ointment.***Action and Uses.**

Iodoform is an antiseptic, disinfectant, alterative, and antitubercular. It is used as a dressing for wounds, ulcers, fistulous tracts, and burns. It is injected into tubercular abscess cavities, joints, and pleural sac.

Toxicology.—See Iodin.

IPECAC

Derivation.—The roots of *Ipecacuanha Cephaëlis*.

Constituents.—Emetin and Cephaëlin.

Synonym.—Ipecacuanha.

Dosage.— $\frac{1}{2}$ –20 grains.

Preparations.

Fluidextract.—Dose, $\frac{1}{2}$ –20 minims.

Syrup.—Dose, $\frac{1}{4}$ –2 drams.

Wine.—Dose, 1–60 minims.

Powder of Ipecac and Opium (Dover's Powder).—

Dose, 3–15 grains.

Tincture of Ipecac and Opium.—Dose, 3–15 minims.

Emetin.—Dose, $\frac{1}{12}$ – $\frac{1}{60}$ grain.

Physiologic Action.

Irritant.—Applied to the skin or mucous membrane, ipecac produces irritation followed by redness and, if prolonged, by pustules.

Emetic.—Very small doses act as a gastric sedative, but larger doses produce nausea and vomiting by its local irritation and by its action on the vomiting center in the medulla.

Cholagogue.—Ipecac is said to increase the flow of bile.

Diaphoretic.—This drug causes a slight increase in the excretion of the sweat.

Expectorant.—Ipecac produces a congestion of the bronchial mucous membrane and increases its secretions.

Cardiac Sedative.—In moderate doses ipecac reduces the heart's action.

Therapeutic Indication.

As an *emetic* in all forms of poisoning if the toxic material is in the stomach and is not of a corrosive character. It is also employed to unload the engorged bronchi in suffocative bronchitis and croup in children, and in laryngitis.

As a *gastric sedative* in some types of persistent vomiting, it is very useful if given in minute doses.

As an *expectorant* in bronchitis, laryngitis, asthma, and chronic cough.

As a *diaphoretic* to break up "colds," it is used in the form of Dover's Powder.

Ipecac is said to act as a specific in dysentery, but must be given in very large doses (20 grains every four hours).

EMETIN

The alkaloid of ipecac has come into such prominence of late years that it is now used more frequently than the drug in the treatment of several conditions. Emetin hydrochlorid is the salt commonly employed. Its widest applications are in the treatment of amebic dysentery and pyorrhea alveolaris, or Riggs' disease. It is administered either by mouth, by hypodermic,

or locally. In dysentery, $\frac{1}{4}$ to $\frac{1}{2}$ grain in sterile water may be given under the skin three times a day.

IRIS (*)

IRON COMPOUNDS

REDUCED IRON

Synonyms.—Ferrum Reductum, Quevenne's Iron, Iron by Hydrogen.

Dosage.—1–5 grains.

IRON ARSENATE

Synonym.—Ferri Arsenias.

Action is that of arsenic and iron combined.

Dosage.— $\frac{1}{16}$ – $\frac{1}{8}$ grain.

IRON BROMID

Dosage.—1–5 grains.

IRON CARBONATE

Preparations.

Saccharated Iron Carbonate.—Dose, 2–10 grains.

Mass of Iron Carbonate (Vallet's Mass).—Dose, 1–5 grains.

Mixture of Iron Carbonate (Griffith's Mixture).—Dose, 1–4 drams.

IRON CHLORID

Synonyms.—Ferri Chloridum, Ferri Perchloridum, Ferric Chlorid.

Preparations.

Solution of Iron Chlorid.—Dose, 2–10 minims, well diluted.

Tincture of Iron Chlorid.—Dose, 5–60 minims.

Solution of Iron and Ammonium Acetate (Basham's Mixture).—Dose, 1-4 drams.

IRON CITRATE

This is a scale preparation of iron and is soluble in water.

Dosage.—1-10 grains.

IRON HYPOPHOSPHITE

Has combined action of iron and phosphorus.

Dosage.—1-10 grains.

IRON IODID

Preparations.

Saccharated Iron Iodid.—Dose, 5-15 grains.

Syrup of Iron Iodid.—Dose, 5-30 minims.

IRON OXID

Preparations.

Hydrated Iron Oxid (Hydrated Iron).—Dose, 1-4 drams.

Hydrated Iron Oxid with Magnesia (Arsenic antidote).—Prepared by mixing equal parts of the two following solutions : (1) Iron sulphate solution, 2 ounces ; water, $3\frac{1}{2}$ ounces. (2) Magnesia, $2\frac{1}{2}$ drams ; water, 25 ounces.

Saccharated Iron Oxid (Eisenzucker).—Dose, 10-30 grains.

IRON PHOSPHATE (SOLUBLE)

Dosage.—1-5 grains.

IRON SUBSULPHATE SOLUTION

Synonym.—Monsel's Solution.

Dosage.—2-10 minims.

IRON SULPHATE

Synonyms.—Green Vitriol, Copperas.

Preparations.

Dried Iron Sulphate.—Dose, $\frac{1}{2}$ –2 grains.

Blaud's Mass and Pills contain iron sulphate and potassium carbonate.

IRON VALERIANATE

Has combined action of valerian and iron.

Dosage.—1–15 grains.

COMPOUND IRON PREPARATIONS

Ammonium and Iron Citrate.—Dose, 3–10 grains.

Ammonium and Iron Tartrate.—Dose, 5–10 grains.

Iron and Potassium Tartrate.—Dose, 10–30 grains.

Iron and Quinin Citrate.—Dose, 3–10 grains.

Iron and Strychnin Citrate.—Dose, 2–5 grains.

Iron, Quinin, and Strychnin Citrate.—Dose, 1–5 grains.

Incompatibilities of Iron.

Tannic acid and all substances containing it, as the vegetable infusions and alkalies, lime-water, carbonates, salicylates, mercuric salts, and albumin, should not be prescribed with iron.

Physiologic Action of Iron.

Astringent.—Applied to the mucous surface or the broken skin, iron salts act as powerful astringents, coagulating albumin and checking any secretions or bleeding.

Hematinic.—Taken internally iron causes an increase in the amount of hemoglobin in the blood, and also an increase of the red cells.

Intestinal Astringent.—In the intestines iron lessens the secretions and causes constipation. Unabsorbed iron combines with the sulphur in the bowels and forms iron sulphid, which colors the feces black.

Therapeutic Indications.

As an *astringent* to control bleeding points or to astringe relaxed tissues, as in pharyngitis, tonsillitis, and relaxed uvula. Also in diarrheas and hemorrhages of the gastro-intestinal tract.

As a *hematinic* in anemia of any form.

Administration.—As a local astringent the solution of iron chlorid or iron subsulphate are best. As a hematinic in anemia most any form may be employed, but the scale preparations (citrates and tartrates) are least constipating. Blaud's mass or the reduced iron are very useful in anemia.

In giving the tincture of iron chlorid use a glass tube to prevent action on the teeth.

The administration of an excessive amount of iron is indicated by frontal headache, constipation, and flushing of the skin.

JALAP

Derivation.—The tuberous roots of *Jalapa Ipomea*.

Dosage.—5–20 grains.

Preparations.

Extract.—Dose, 1–5 grains.

Compound Powder (Purging Powder) contains jalap and cream of tartar. Dose, 15–60 grains.

Resin.—Dose, 1–5 grains.

Physiologic Action.

Purgative (Drastic).—Jalap stimulates the intestinal

peristalsis and secretions and produces profuse watery bowel movements.

Depletant.—By its action on the bowels it lessens the circulation and engorgement in other parts of the body, and also aids in reducing fluid accumulations.

Therapeutic Indications.

As a *purgative* for obstinate constipation and when rapid emptying of the bowels is necessary.

As a *depletant* in all forms of dropsy and anasarca. In cerebral congestion and plethora of any part of the body.

JUNIPER (*)

KAMALA (*)

KINO (*)

KOLA (*)

KRAMERIA (*)

LANUM (*)

LEAD COMPOUNDS

LEAD ACETATE

Synonyms.—Plumbi Acetas, Sugar of Lead.

Properties.—A white crystalline powder or mass with a sweet taste. It is soluble in water (2 parts), alcohol (25 parts).

Incompatibilities.—Acids, alkalies, tannin, carbonates, iodids, and lime-water.

Dosage.— $\frac{1}{2}$ –2 grains.

Preparations.

Solution of Lead Subacetate (Goulard's Extract).—

The dilute form of lead-water is produced by taking 3 parts of this solution and 100 parts of water.

Cerate of Lead Subacetate (Goulard's Cerate).

LEAD CARBONATE

Synonym.—White Lead.

Preparation.

Ointment.

LEAD IODID

Dosage.—1-4 grains.

Preparation.

Ointment.

LEAD OXID

Synonym.—Litharge.

Preparation.

Plaster.—(Lead plaster, diachylon plaster, and lead oleate.)

Physiologic Action of Lead.

Astringent.—Applied externally lead salts produce coagulation of albumin, contraction of the vessels, and a decrease of secretions. Internally the salts act as astringents and cause constipation.

Therapeutic Indications.

Used *externally* to dress wounds, ulcers, and eczema. Also as an astringent wash in leukorrhea, vulvitis, gonorrhea, and itching.

Internally some of the lead salts are employed in diarrhea, dysentery, intestinal hemorrhage, and night-sweats.

Toxicology.—*Acute poisoning* is characterized by nausea, vomiting, colic, constipation, cold and moist skin, and, finally, collapse.

Management.—Wash out the stomach, and give magnesium sulphate or sodium sulphate. Stimulate if necessary.

Chronic poisoning follows the prolonged use of lead as a medicine; the use of water contaminated by lead pipes; the use of hair dyes containing lead salts; working in lead or using it much as a paint. The signs are: Anemia, severe abdominal colic centering around the umbilicus, obstinate constipation, headache, hard pulse, blue line on the gums near the margin of the teeth, and, later, various forms of paralyses, especially wrist-drop. To this set of symptoms the terms *plumbism* or *saturnism* are applied.

Management.—Stop the administration or source of the poison, then aid in its elimination by giving sulphates, as Epsom salt and also the iodids. For the colic, opium may be given, and for the paralysis, use electricity and strychnin.

LEPTANDRA (*)

LITHIUM SALTS

LITHIUM BENZOATE

Has the same action as Benzoic Acid (which see).

Dosage.—5-20 grains.

LITHIUM BROMID

Same action as, but less irritating than, Potassium Bromid.

Dosage.—5-20 grains.

LITHIUM CARBONATE

Properties.—A white, odorless powder, soluble in water (80 parts) and insoluble in alcohol.

Dosage.—5–15 grains.

LITHIUM CITRATE

Properties.—A colorless crystal, soluble in water (4 parts) and insoluble in alcohol.

Dosage.—5–20 grains.

Physiologic Action.

These salts taken internally *render the urine alkaline*, are said to prevent the formation of uric-acid calculi, and act as *diuretics*.

Therapeutic Indications.

They are chiefly used in gout, rheumatic affections, diseases of the bladder, and urinary calculi.

LITHIUM IODID

This salt acts the same as Potassium Iodid, but the former is less irritating.

Dosage.—1–5 grains.

LITHIUM SALICYLATE

Has same action as Sodium Salicylate (which see).

Dosage.—10–30 grains.

LOBELIA (*)

MAGNESIUM COMPOUNDS

MAGNESIUM CARBONATE

Dosage.— $\frac{1}{2}$ –2 drams.

Preparation.

Effervescent Magnesium Citrate Solution.—This is

prepared by taking of magnesium carbonate $1\frac{1}{2}$ drams and citric acid 3 drams, dissolved in 2 ounces of water. Stir these together until dissolved, then strain into a strong 8-ounce bottle and add enough syrup and water to nearly fill the bottle; then to the contents add $\frac{1}{2}$ dram of potassium bicarbonate, cork the bottle securely and quickly, and shake until the bicarbonate is dissolved. Dose, 2–8 ounces.

MAGNESIUM OXID

Synonym.—Magnesia.

Dosage.—10–30 grains.

MAGNESIUM SULPHATE

Synonym.—Epsom Salt.

Dosage.—2–8 drams.

Physiologic Action.

Antacid.—Taken internally the carbonate and oxid act as antacids and gastric sedatives.

Cathartic.—The citrate and sulphate are saline purgatives, increasing the watery contents of the bowels; stimulating peristalsis, and causing watery bowel movements.

Therapeutic Indications.

As an *antacid* in gastric fermentation, acid dyspepsia, heartburn, and migraine.

As a *cathartic* to reduce fluid accumulations, as in dropsy (renal or cardiac), and for thoroughly evacuating the bowels.

Administration.—When Epsom salt is given for the purpose of reducing fluid accumulations it should be employed in concentrated solution.

If a highly concentrated solution of magnesium sulphate is given to persons who are not dropsical or edematous, toxic effects may follow and result seriously.

MANGANESE COMPOUNDS

MANGANESE DIOXID

Synonyms.—Manganese Peroxid, Black Oxid of Manganese.

Dosage.—1-10 grains.

MANGANESE SULPHATE

A colorless, transparent crystal, freely soluble in water and insoluble in alcohol.

Dosage.—1-10 grains.

POTASSIUM PERMANGANATE

A dark purple crystal or powder, soluble in water (16 parts).

It is *incompatible* with acids, alcohol, bromids, chlorids, tannin, and all forms of organic material.

Dosage.— $\frac{1}{2}$ -3 grains.

Physiologic Action.

Antiseptic.—The permanganate is a strong antiseptic and oxidizing agent.

Hematinic.—Internally manganese increases the number of red cells and the hemoglobin of the blood.

Emmenagogue.—The dioxid and permanganate stimulate the menstrual flow.

Cholagogue.—The sulphate increases the flow of bile.

Therapeutic Indications.

As an *antiseptic* potassium permanganate is employed in solution (1 : 50 to 1 : 1000) in mouth affections, rhi-

nititis, diphtheria, gonorrhea, leukorrhea, and also as an application to wounds. Owing to its oxidizing powers this salt is used as a deodorizer on putrid wounds and ulcers.

As a *hematinic* in anemia of the chlorotic type.

As an *emmenagogue* in suppressed menstruation due to anemia or atony.

MENTHA PIPERITA

Derivation.—The leaves and tops of *Mentha Piperita*.

Synonym.—Peppermint.

Constituents.—Menthol and a volatile oil.

Preparations.

Oil.—Dose, 1–5 minims.

Spirit.—Dose, 5–15 minims.

Water.—Dose, 1–8 drams.

Menthol.—A stearothen from the oil of peppermint. Soluble freely in alcohol and in 4 parts of olive oil. Dose, 1–5 grains.

Physiologic Action.

Local Anodyne.—Applied to the skin or mucous membrane the oil or menthol produce first a cooling sensation, followed by numbness.

Carminative.—Peppermint aids in the expulsion of flatus.

Therapeutic Indications.

As an *analgesic* in toothache, headache, neuralgia, gastralgia, and itching.

As a *carminative* in flatulent dyspepsia, infantile colic, and diarrhea.

MERCURY COMPOUNDS

AMMONIATED MERCURY

Synonym.—White Precipitate.

Preparation.

Ointment.

MERCURY BICHLORID

Synonyms.—Hydrargyri Chloridum Corrosivum, Corrosive Sublimate.

Properties.—A white crystalline mass, soluble in water (20 parts), in alcohol (5 parts).

Dosage.— $\frac{1}{80}$ — $\frac{1}{12}$ grain.

Preparation.

Yellow Wash (Lotio Flava).—Prepared by mixing $\frac{1}{2}$ dram of mercury bichlorid with 1 pint of lime-water.

MERCURY CHLORID

Synonyms.—Hydrargyri Chloridum Mite, Calomel, Mild Chlorid of Mercury.

Properties.—A white powder devoid of odor and taste. Insoluble in water or alcohol.

Dosage.— $\frac{1}{10}$ —10 grains.

Preparation.

Black Wash (Lotio Nigra).—Prepared by adding 1 dram of calomel to 1 pint of lime-water.

MERCURY IODID (RED)

Synonym.—Mercury Biniodid.

Properties.—A red powder, insoluble in water, but soluble in a solution of potassium iodid.

Dosage.— $\frac{1}{16}$ — $\frac{1}{8}$ grain.

Preparation.

Solution of Arsenic and Mercuric Iodid (Donovan's Solution).—Dose, 1–10 minims.

MERCURY IODID (YELLOW)

Synonyms.—Protoiodid of Mercury, Green Iodid of Mercury.

Properties.—A yellow or green powder, devoid of taste and odor, and insoluble in water or alcohol.

Dosage.— $\frac{1}{4}$ –1 grain.

MERCURY OXID (RED)

Synonym.—Red Precipitate.

Preparation.

Ointment.

MERCURY OXID (YELLOW)

Preparations.

Ointment.

Oleate of Mercury.

MERCURY SUBSULPHATE (YELLOW)

Synonym.—Turpeth Mineral.

Dosage.—2–4 grains.

METALLIC MERCURY PREPARATIONS

Mercury with Chalk (Hydrargyrum cum Creta, Gray Powder) contains 38 per cent. of mercury. Dose, $\frac{1}{2}$ –10 grains.

Mercury Mass (Massa Hydrargyri, Blue Mass) contains 33 per cent. of mercury. Dose, $\frac{1}{2}$ –15 grains.

Mercury Ointment (Blue Ointment) contains 50 per cent. of mercury.

Mercury Plaster contains 30 per cent. of mercury.

Mercury Plaster (with Ammoniac) contains 18 per cent. of mercury.

Incompatibilities of Mercury Compounds.

Alkalies, alkaloids, albumin, bromids, lime-water, tannin, and infusions.

Physiologic Action.

Antiseptic.—The bichlorid is one of the best and most efficient of the antiseptics. A 1 : 1000 solution destroys bacterial life. It is extensively used in surgery for all antiseptic purposes except the sterilization of metallic instruments, which the chemic action will corrode.

Parasiticide.—Mercury preparations rapidly destroy animal and vegetable parasites that may be found on the skin.

Caustic.—Some of the mercurials (red iodid) act upon the skin as an irritant and, if the action is prolonged, as a caustic.

Cathartic.—All mercury preparations are irritating to the intestinal tract, producing looseness of the bowels, but calomel, gray powder, and blue mass are most used for this purpose.

Cholagogue.—Calomel is said to indirectly increase the flow of bile.

Hematinic.—Mercury in small doses increases the number of red cells in the blood, but its prolonged action will produce anemia.

Diuretic.—Calomel when combined with diuretics augments their action.

Sialagogue.—Mercury is excreted in the saliva, which secretion it greatly increases.

Antisyphilitic.—Mercurials cause the absorption and disappearance of syphilitic processes.

Therapeutic Indications.

As an *antiseptic* for sterilizing the hands ; the site of operation ; the basins, etc. As a wet dressing for infected wounds and as an irrigating solution.

As a *parasiticide* the bichlorid, blue mass, and ammoniated mercury or the oleate are used for pediculosis, favus, and ringworm.

As a *cathartic* in the beginning of the acute fevers, especially in the form of calomel, blue mass, or gray powder. It is best to follow the mercurial with a saline.

As a *hematinic* in anemia.

As a *diuretic* in nephritis, especially if given with another diuretic, as digitalis and squill.

As an *antisyphilitic*, mercury may be employed in any stage of the disease.

Administration.—Calomel is given as a cathartic in several ways, among the most frequent are: $\frac{1}{10}$ grain every half hour until ten doses are taken, or 1 grain every hour until five doses are taken, or in mass doses of 5 or 10 grains. In cases where there is vomiting and all drugs are ejected as soon as taken, a most excellent plan is to place 5 grains of calomel powder on the patient's tongue and give a small swallow of water. If vomiting occurs, most of the calomel will be retained, as it adheres to the stomach wall. It is always best to follow the administration of calomel with one of the saline purgatives, for two reasons: Calomel acts mostly on the upper part of the intestines, while the salts will effect the lower portion, and, if a large dose of calomel has been given, the saline will wash out the excess before poisoning occurs. Sodium bicarbonate should be combined with mass doses of calomel, as this prevents part of the calomel from being converted into mercury bichlorid.

In *syphilis*, mercurials may be administered in many ways. By *mouth*, the best preparation to be given is

probably the yellow or protoiodid. The bichlorid, the red iodid, and gray powder are also much used. By *hypodermic*, the bichlorid is employed in doses of $\frac{1}{12}$ grain in 15 minims of water, given every other day, or gray oil may be used by this method. By *inunction*, the blue ointment or the oleate are most used: 1 dram is well rubbed into the skin every few days, selecting a different site for each application. By *fumigation*, calomel is generally employed: 15 grains of calomel are placed in a metal or porcelain dish over an alcohol lamp, which is placed under the chair of the patient, and about the entire body of the patient excepting the head is placed a blanket in the shape of a tent. By *baths*, 2 drams of the bichlorid are dissolved in 20 gallons of water and to this 20 drops of hydrochloric acid are added to aid in the solution of the mercury salt. The patient remains in the bath for only a few minutes. As a *local application* to the primary lesions, the black or yellow wash are excellent.

Pretoxic Signs.—Slight salivation, vague abdominal colic, and looseness of the bowels.

Toxicology.—*Acute Poisoning.*—Great flow of saliva, vomiting (which may become bloody), diarrhea, suppression of urine, cold, moist skin, weak pulse, and collapse.

Management.—Empty and wash the stomach. Give milk, white of egg, flour paste, and starch-water. Stimulate with ammonia, brandy, and strychnin.

Chronic Poisoning, or Mercurialism.—This is characterized by anemia, emaciation, dyspepsia, trembling, dizziness, headache, fetor of the breath, soreness of the gums, looseness of the teeth, and various forms of paralyses.

METHYLENE-BLUE (*)

MUSK (*)

MUSTARD (*)

NAPHTOL (*)

NITRIC ACID

Definition.—A clear, fuming liquid, which contains 68 per cent of absolute nitric acid in water.

Dosage.—1–5 minims, well diluted.

Preparations.

Dilute Nitric Acid (10 per cent. strength).—Dose, 5–20 minims.

Nitrohydrochloric Acid (Aqua Regia, Nitromuriatic Acid).—Dose, 1–5 minims.

Physiologic Action.

Caustic.—Applied externally it produces a burning sensation, followed by destruction of tissue.

Cholagogue.—This acid increases the flow of bile and stimulates the liver. This is particularly true of the nitrohydrochloric acid.

Therapeutic Indications.

As a *caustic* nitric acid is much used for cauterizing the bites of animals, and in the treatment of chancroids, warts, indolent ulcers, and condylomata.

Internally these acids are useful in jaundice, chronic hepatitis, and diarrhea.

Toxicology.—See under Hydrochloric Acid.

NITROGLYCERIN

Derivation.—A yellow, clear, oily, explosive liquid, formed by the action of nitric and sulphuric acids on

glycerin. It is soluble in alcohol and only slightly in water.

Synonyms.—Glonoin, Trinitrin, Glyceryl Trinitrate.

Preparation.

Spirit (Spirit of Glonoin, Solution of Trinitrin, Spiritus Glycerylis Nitratis).—This is a 1 per cent. solution of nitroglycerin in alcohol. Dose, 1–3 minims.

Action and Use.

The action and use of nitroglycerin is the same as that of amyl nitrite, except that the action of the former is slower and more prolonged.

NUX VOMICA

Derivation.—The seeds of *Strychnos Nux Vomica*.

Synonyms.—Poison Nut, Quaker Button, Dog Button.

Constituents.—Alkaloids : Strychnin and Brucin.

Dosage.—1–4 grains.

Preparations.

Extract.—Dose, $\frac{1}{8}$ – $\frac{1}{2}$ grain.

Fluidextract.—Dose, 1–4 minims.

Tincture.—Dose, 5–15 minims.

Strychnin.—Dose, $\frac{1}{100}$ – $\frac{1}{30}$ grain.

Strychnin Nitrate.—Dose, $\frac{1}{100}$ – $\frac{1}{30}$ grain.

Strychnin Sulphate.—Dose, $\frac{1}{100}$ – $\frac{1}{30}$ grain.

Physiologic Action.

Stomachic.—Nux vomica excites the secretion of the gastric juice, sharpens the appetite, and stimulates the motor power of the stomach and intestines.

Cardiac Stimulant.—Strychnin is one of our best cardiac stimulants ; it increases both the rate and power of the heart.

Respiratory Stimulant.—The number and depth of the respirations are increased by this drug.

Spinal Stimulant.—Strychnin exerts its energy on the motor fibers of the cord, producing increased muscle tone and reflexes. In very large doses it causes muscular twitchings and convulsions.

Cerebral Stimulant.—This drug stimulates the special centers of the brain, producing acuteness of hearing, sight, and smell.

Therapeutic Indications.

As a *stomachic* in atonic dyspepsia, anorexia, anemia, and constipation.

As a *stimulant* in shock, syncope, cardiac failure of the acute fevers, and in drug poisoning.

As a *muscle tonic* in paralysis of apoplexy, neuritis, arsenic- and mercury-poisoning.

Administration.—As a stomachic, the best preparation is the tincture. As a stimulant, any of the salts of strychnin are to be preferred. It is well to remember that the continuous use of strychnin in the acute fevers, especially typhoid fever, may prevent the temperature from becoming normal as soon as it would otherwise.

Pretoxic Signs.—Slight twitching of the muscles, increase of reflex action, and restlessness.

Toxicology.—The symptoms of strychnin-poisoning are increased reflex excitability, muscular twitching, rigidity of the neck, rapid pulse, acuteness of hearing, and convulsions of the tetanic type with opisthotonos.

Management.—Give rectal injections of chloral and bromids. Wash out the stomach and administer tannic acid. Inhalations of amyl nitrite are useful.

OPIUM

Derivation.—The inspissated juice of *Papaver Somniferum*.

Constituents.—Morphin, codein, narcein, narcotin, papaverin, and other alkaloids of less importance.

Dosage.— $\frac{1}{4}$ –2 grains.

Preparations.

Powdered Opium.—Dose, $\frac{1}{4}$ –2 grains.

Extract.—Dose, $\frac{1}{8}$ –1 grain.

Tincture (Laudanum).—Dose, 3–15 minims.

Deodorized Tincture.—Dose, 3–15 minims.

Camphorated Tincture (Paregoric).—Dose, 1–4 drams.

Vinegar (Black Drop).—Dose, 3–15 minims.

Wine (Sydenham's Laudanum).—Dose, 3–15 minims.

Deodorized Opium.—Dose, $\frac{1}{4}$ –1 grain.

Powder of Opium and Ipecac (Dover's Powder).—
Dose, 3–15 grains.

Plaster.

Morphin.—Dose, $\frac{1}{8}$ – $\frac{1}{4}$ grain.

Morphin Hydrochlorate.—Dose, $\frac{1}{8}$ – $\frac{1}{4}$ grain.

Morphin Sulphate.—Dose, $\frac{1}{8}$ – $\frac{1}{4}$ grain.

Codein.—Dose, $\frac{1}{4}$ –2 grains.

Codein Phosphate.—Dose, $\frac{1}{4}$ –1 grain.

Codein Sulphate.—Dose, $\frac{1}{4}$ –2 grains.

Heroin is an artificial alkaloid formed by the action of acetic acid on morphin.—Dose, $\frac{1}{24}$ – $\frac{1}{6}$ grain.

Heroin Hydrochlorate.—Dose, $\frac{1}{24}$ – $\frac{1}{6}$ grain.

Dionin (an artificial alkaloid).—Dose, $\frac{1}{4}$ –1 grain.

Cotarnin Hydrochlorate (an oxidation product of

Narcotin, known as Stypticin, see Part IV.).—

Dose, $\frac{1}{2}$ –4 grains.

Physiologic Action.

Hypnotic.—Opium is our greatest sleep producer. It first stimulates the brain, slightly increasing the intellection and imagination, and then quiets the nervous system, producing sleep.

Analgesic and Antispasmodic.—Opium depresses the motor and sensory fibers, thus producing a decrease of motor excitability and a blunting of the pain sense.

Cardiac Stimulant.—Opium in medicinal doses slows the heart's action, but increases the force.

Myotic.—Given internally in moderate doses this drug produces contraction of the pupils.

Secretory Depressor.—Opium lessens all the secretions of the body except the perspiration, which is increased. Opium causes constipation.

Therapeutic Indications.

As an *hypnotic* in cases of sleeplessness accompanied by pain, and in insomnia of exhausting fevers, also in the wakefulness of chronic alcoholism, mania, and insanity.

As an *analgesic* in pain from nearly all causes except congestion of the brain. Opium should not be administered if its action will dispel any points in making a diagnosis.

As an *antispasmodic* in epilepsy, asthma, intestinal colic, convulsions, tetanus, cough, biliary, renal, and vesical colic.

As a *secretory depressor* in diarrhea, dysentery, cholera, ptyalism, and diabetes.

Comparative Action.—*Morphin* possesses the same

general action of opium, except that the former is less narcotic, more analgesic, more rapid, less constipating, less diaphoretic, and more depressing to the heart.

Codein has the same action as morphin, except that the former is more feeble and has especial powers as a cough sedative.

Heroin has the same cough-sedative action as codein, but is more depressing.

Dionin is similar to heroin.

Cotarnin is especially active as a vasoconstrictor.

Administration.—As an analgesic morphin is preferable. As a secretory depressor, powdered opium, laudanum, and paregoric are to be employed. As a cough sedative codein or heroin should be chosen. Children bear opium and its derivatives very poorly, and it should be given to them in very small doses and with extreme caution. In susceptible persons and some alcoholics the narcotic should be reinforced by some stimulant, as atropin or strychnin.

Pretoxic Signs.—Tendency to pupillary contraction, drowsiness, dryness of the mouth, sweating.

Toxicology.—*Acute Poisoning.*—Small pupils, slow, full pulse, becoming rapid, slow respirations, hot skin, cyanosis, and asphyxia.

Management.—Wash out the stomach at once or give emetics followed by tannic acid or potassium permanganate. Keep the patient aroused by constant flagellation. Give atropin, coffee enemata, ammonia, strychnin, but not digitalis.

Chronic Poisoning.—This is characterized by smallness of the pupils, loss of appetite, anemia, insomnia, mental unrest, constipation, muscular weakness, tremor,

immorality. The patient will steal or tell untruths in order to procure the drug.

Management.—Withdraw the drug and substitute hyoscin or cannabis indica temporarily. Overcome insomnia by hydrotherapeutic methods and the bromids, chloral, or paraldehyd. Give tonics and good food and, above all, use moral suasion.

OX-GALL

Derivation.—The fresh bile or gall of *Bos Tauris*, the domestic ox.

Synonyms.—Fel Bovis, Fel Tauri.

Dosage.—5–15 grains.

Physiologic Action.

In the stomach it interferes with digestion, and for this reason it is much employed in keratin-covered tablets, which pass through the stomach unaffected. Having gained entrance to the intestines it increases the flow of bile and stimulates peristalsis. For this last purpose it is given in the form of an enema by adding 15 grains of powdered ox-gall to the regular enema.

PANCREATIN

Derivation.—A mixture of ferments from the fresh pancreas of the hog.

Dosage.—5–15 grains.

Action and Use.

Pancreatin has the power of digesting meats, starches, sugars, and of emulsifying fats. It can act only in an alkaline solution, therefore it does not act in the stomach unless sodium bicarbonate be given with

it to neutralize the acid of the stomach. Some authorities say that a minute amount of acid will destroy pancreatin, hence its value as a digestive agent is questionable. It is much used, however, as an ingredient of "peptonizing" powders for preparing partially digested milk, junket, etc.

PAPAIN

Derivation.—A ferment derived from the juice of *Carica Papaya*.

Synonyms.—Papayotin, Papoid, Papaw

Dosage.—1-5 grains.

Action and Use.

This ferment is capable of digesting proteid, carbohydrates, and fats in a neutral, alkaline, or acid medium. Whether it will do all this is much doubted.

Locally it will dissolve necrotic tissue, and is used for this purpose in diphtheria, warts, and small growths.

PARAFFIN OIL

Paraffin oil, Russian oil, petrolatum liquidum are terms applied to a liquid petroleum used very extensively for the relief of chronic constipation. It acts in a mechanical way by lubricating the intestinal canal and stimulating peristalsis. It should be taken several times a day in doses of $\frac{1}{2}$ to 1 ounce.

PARALDEHYD (*)

PEPSIN

Derivation.—A ferment derived from the stomach of the pig.

Preparations.

Pure Pepsin.—Dose, 5–15 grains.

Saccharated Pepsin.—Dose, 5–60 grains.

Compound Powder (Lactated Pepsin).—Dose, 5–15 grains.

Action and Use.

Pepsin has the power of digesting proteid matter in an acid solution. According to the U. S. Pharmacopœia, 1 grain of pepsin must be capable of digesting at least 3000 grains of proteid matter.

PHENACETIN

Derivation.—A white, odorless, and tasteless powder, produced by the action of glacial acetic acid on a coal-tar derivative. It is insoluble in water. This chemical is now commonly known by its technical name, *acetphenetidin*.

Dosage.—1–10 grains.

Physiologic Action.

Antipyretic.—Phenacetin will cause a fall of febrile temperature.

Analgesic.—The most important action of this drug is its power to relieve pain.

Comparative Action.—Compared to acetanilid and antipyrin, phenacetin is much safer and less depressing, but it is slightly less powerful.

Therapeutic Action.

As an *antipyretic* in scarlatina, rheumatism, and influenza.

As an *analgesic* in neuralgias, influenza, headaches, rheumatism, ovaralgia, and locomotor ataxia.

Administration.—Acetphenetidin is very often com-

bined with caffein. This latter drug is supposed to overcome any depressing effects of the former. The author finds the use of an equal weight of sodium bicarbonate more valuable.

Toxicology.—See Acetanilid. The writer has never seen reported a case of fatal poisoning by this drug.

PHOSPHORUS COMPOUNDS

Preparations of Phosphorus.

Oil of Phosphorus.—Dose, 1–4 minims.

Spirit.—Dose, 8–30 minims.

Elixir.—Dose, $\frac{1}{2}$ –1 dram.

Physiologic Action.

Bone Stimulant.—Given internally phosphorus stimulates the growth of bone.

Hematinic.—This drug aids in the formation of blood, causing an increase of the red cells.

Nervine.—Phosphorus is said to stimulate nerve reconstruction and act as a tonic to the nervous system.

Therapeutic Indications.

As a *bone stimulant* in rachitis, osteomalacia, and caries of bone.

As a *nerve tonic* in nervous and sexual exhaustion, typhoid fever, melancholia, and mania.

As a *hematinic* in anemia, leukemia, and pseudoleukemia.

Toxicology.—*Acute Poisoning.*—Nausea, vomiting, abdominal colic, jaundice, scanty, high-colored urine, and collapse.

Management.—Wash out the stomach. Give oil of turpentine (especially old oil) and copper sulphate as antidotes. Stimulate.

Chronic poisoning occurs in persons employed where phosphorus is used and is characterized by anemia, bronchitis, spongy gums, and necrosis of bone, especially of the lower jaw.

DILUTE PHOSPHORIC ACID

This is a 10 per cent. solution, and is used in those diseases where phosphorus is indicated.

Dosage.—10–60 minims.

GLYCERINOPHOSPHATES

Calcium Glycerinophosphate.—Dose, 2–5 grains.

Iron Glycerinophosphate.—Dose, 2–5 grains.

Magnesium Glycerinophosphate.—Dose, 1–5 grains.

Potassium Glycerinophosphate.—Dose, 2–10 minims.

Sodium Glycerinophosphate.—Dose, 2–10 grains.

These preparations are generally administered in liquid form in nervous disorders, as neurasthenia, deficient nerve nutrition, and anemia.

HYPOPHOSPHITES

Ammonium Hypophosphite.—Dose, 1–3 grains.

Calcium Hypophosphite.—Dose, 5–20 grains.

Iron Hypophosphite.—Dose, 3–10 grains.

Manganese Hypophosphite.—Dose, 3–10 grains.

Potassium Hypophosphite.—Dose, 5–20 grains.

Quinin Hypophosphite.—Dose, 1–5 grains.

Sodium Hypophosphite.—Dose, 5–20 grains.

Action and Use.

The hypophosphites are used mostly in tuberculosis, nervous exhaustion, anemia, and depraved conditions of the system.

The ammonium salt is especially useful in bronchitis.

These salts are generally administered in the form of a syrup.

PHOSPHATES

Calcium Phosphate.—Used in rickets and anemia.
Dose, 5–20 grains.

Iron Phosphate.—Used in anemia and amenorrhea.
Dose, 1–5 grains.

Sodium Phosphate.—This salt is very useful, and is much employed in jaundice, hepatitis, biliousness, rickets, and headaches due to gastric disorder.

ZINC PHOSPHID

Used as a substitute for phosphorus.—Dose, $\frac{1}{20}$ – $\frac{1}{8}$ grain.

PHYSOSTIGMA

Derivation.—The seed or bean of *Physostigma Venenosum*.

Synonym.—Calabar Bean.

Constituents.—Physostigmin or Eserin.

Dosage.— $\frac{1}{12}$ – $\frac{1}{2}$ grain.

Preparations.

Extract.—Dose, $\frac{1}{12}$ – $\frac{1}{2}$ grain.

Tincture.—Dose, 5–20 minims.

Physostigmin (or Eserin) Salicylate.—Dose, $\frac{1}{120}$ – $\frac{1}{40}$ grain.

Physiologic Action.

Spinal Depressant.—Eserin depresses both sides of the cord, especially the sensory tracts, and lessens sensation and reflex action.

Involuntary Muscle Stimulant.—This drug stimulates the involuntary muscle of the gastro-intestinal tract, thus increasing peristalsis, and of the vascular coats, causing vasoconstriction.

Myotic.—Eserin produces pupillary contraction.

Therapeutic Indications.

As a *spinal depressant* in tetanus, strychnin-poisoning, convulsions, and asthma.

As a *muscle stimulant* in gastric atony and dilatation, in constipation, and in post-operative paresis of the bowels with distention.

As a *myotic* in glaucoma and ciliary paresis.

Toxicology.—Muscular weakness, tremor, relaxation, small pupils, slow pulse and respirations.

Management.—Give atropin, strychnin, coffee, and ammonia.

PHYTOLACCA (*)

PICRIC ACID

Derivation.—A yellow crystal with a very bitter taste, formed by the action of nitric acid on creosote.

Synonyms.—Picronitric Acid, Carbazotic Acid, Trinitrophenol.

Action and Use.

Picric acid acts somewhat like quinin as an **anti-periodic**, and is used in the treatment of malaria.

Externally it is used extensively as a dressing for burns. The writer is told that in some of the iron mines and works of Pennsylvania it is exclusively employed for this purpose. It is applied as a saturated watery solution.

It is also recommended in the treatment of trichinosis.

PICROTOXIN (*)

PILOCARPUS

Derivation.—The leaves of *Pilocarpus Jaborandi*.

Synonym.—Jaborandi.

Constituent.—Pilocarpin, a liquid alkaloid.

Dosage.—5-30 grains.

Preparations.

Fluidextract.—Dose, 5-30 minims.

Pilocarpin Hydrochlorate.—Dose, $\frac{1}{12}$ - $\frac{1}{4}$ grain.

Physiologic Action.

Sialagogue.—Pilocarpin greatly increases the secretion of saliva.

Diaphoretic.—This drug is our most powerful sweat producer. Its action may continue for from one to three hours, producing from twelve to twenty-four ounces of perspiration.

Galactagogue.—The secretion of milk in nursing mothers is greatly increased by the use of this drug.

Cardiac Depressant.—Pilocarpin, being unique in its other actions, is less frequently used because of its depressing effect on the heart.

Myotic.—The pupils are contracted by the use of this drug.

Therapeutic Indications.

As a *diaphoretic* in fluid accumulations, as dropsy. In uremia, chronic nephritis, and eclampsia.

As a *myotic* in glaucoma.

The use of this drug has been recommended in baldness as a local applicant.

Pretoxic Signs.—Disturbance of vision and vomiting.

Toxicology.—Poisoning is characterized by vomiting, purging, salivation, parotid tenderness, contracted pupils, vesical tenesmus, yawning, slow pulse, which becomes rapid, and collapse.

Management.—Empty the stomach by a tube or emetics. Give tannic acid. Stimulate with atropin and ammonia.

PITUITARY GLAND

The use of this gland or, better, of a preparation known as *pituitrin* has become quite prominent. It is employed as a uterine stimulant in slow labor. Its use is not free from danger. Pituitrin in these cases is given hypodermically in doses of 5 to 15 minims.

PODOPHYLLUM

Derivation.—The rhizome and roots of *Podophyllum Peltatum*.

Synonyms.—Mandrake, May Apple.

Dosage.—5–30 grains.

Preparations.

Extract.—Dose, 2–10 grains.

Fluidextract.—Dose, 5–30 minims.

Podophyllin (Resin).—Dose, $\frac{1}{8}$ – $\frac{1}{2}$ grain.

Physiologic Action.

Cholagogue Cathartic.—Internally mandrake acts as a gastro-intestinal stimulant and increases the flow of bile, producing by this combined action free bowel movements containing much biliary material.

Therapeutic Indications.

Mandrake is employed in biliousness and liver disorders, and in infantile diarrhea when the stools lack color.

Mandrake is commonly known as the vegetable calomel.

POMEGRANATE

Derivation.—The root of *Punica Granatum*.

Synonym.—Granatum.

Dosage.—1–2 drams.

Preparation.

Pelletierin Tannate (Alkaloid).—Dose, 1–12 grains.

Action and Use.

The chief use of pomegranate is as an anthelmintic for the tapeworm. This drug is also employed as an intestinal astringent in diarrhea.

POTASSIUM COMPOUNDS

POTASSIUM ACETATE

A white, deliquescent, crystalline powder, soluble in water and alcohol. Dose, 5–60 grains.

Potassium acetate is used as a *diuretic* in acute nephritis and the contagious fevers. It is also useful in rheumatism, gout, scurvy, eczema, and lithiasis.

POTASSIUM ARSENITE

(See *Arsenic Compounds*)

POTASSIUM BICARBONATE

A white crystal, soluble in water, but insoluble in alcohol. It is used for the same purposes as the acetate. Dose, 10–60 grains.

POTASSIUM BICHROMATE

An orange-colored crystal, soluble in water and alcohol.

Applied to the skin this salt acts as an *irritant* and *caustic*. It is used as such in the treatment of warts, condylomata, and vegetations.

Internally it acts as an *expectorant*, and is employed in bronchitis and aphonia.

Dosage.— $\frac{1}{16}$ – $\frac{1}{6}$ grain.

POTASSIUM BITARTRATE

Synonyms.—Cream of Tartar, Acid Potassium Tartrate, Tartar Crystals.

This salt given in moderate doses acts as a *saline cathartic* without griping. It is also a *diuretic* and renders the urine alkaline.

Dosage.—20 grains to 1 ounce.

POTASSIUM BROMID

Incompatibilities.—Acids, alkaloids, and metallic salts.

Dosage.—5–60 grains.

Physiologic Action.—(This answers for all bromids.)

Gastric Irritant.—Potassium bromid is irritating to the stomach. It lessens the motor power, causes flatulence, and may produce dyspepsia.

Nerve Sedative.—The bromids quiet the nervous system, producing tranquillity, calmness, and decrease of excitability.

Hypnotic.—By continued action on the brain centers the bromids produce a more or less natural sleep.

Antispasmodic.—These salts depress the motor centers, lessening the reflexes and motor excitability.

Cardiac Sedative.—In small doses the heart is not

affected, but in larger amounts the force and rate of the heart are decreased.

Therapeutic Indications.

As a *sedative* in nervous excitability, hysteria, seasickness, vomiting, and the nervous symptoms of the menopause.

As an *hypnotic* in nervous insomnia.

As an *antispasmodic* in delirium tremens, epilepsy, whooping-cough, tetanus, asthma, dysmenorrhea, and strychnin-poisoning.

Administration.—Bromids should never be given in dry form, but always in solution and well diluted, after meals, and not on an empty stomach.

Comparative Action.—*Potassium bromid* is more depressing to the heart and more irritating to the stomach than other bromids. *Sodium bromid* is more hypnotic and less irritating than the former. *Ammonium bromid* is not depressing to the heart, but is very irritating to the stomach. *Lithium bromid* is said to be the most hypnotic and least irritating. *Strontium bromid* is non-irritating and is an excellent hypnotic.

Pretoxic Signs.—Acneal rash, dulness of intellect, and drowsiness.

Toxicology.—By the prolonged use of the bromids a certain set of symptoms appear, to which the name *bromism* is applied. Fetid odor to the breath, apathy, dull expression, dyspepsia, decrease of skin sensibility, hallucinations, and delirium.

POTASSIUM CHLORATE

This salt is much employed as a gargle and mouth-wash in stomatitis, pharyngitis, tonsillitis, and scarlet

fever. One objection to its use in scarlet fever is its irritating action on the kidneys and its liability to cause nephritis. It is used as a 4 per cent. solution.

POTASSIUM CITRATE

Has the same action as the Acetate.

Dosage.—5–30 grains.

POTASSIUM IODID

Incompatibilities.—Starch, sweet spirit of niter, alkaloids, metallic salts, and mercury protoiodid.

Dosage.—5–60 grains.

Physiologic Action.—(This answers for all iodids.)

Gastric Irritant.—The iodids are very irritating to the stomach and may produce nausea, vomiting, and signs of indigestion.

Absorbent.—The iodids have a peculiar action in causing the absorption of connective tissue, especially that which is newly formed. They also aid in reducing fluid accumulations.

Antisymphilitic.—This is probably the most important action of the iodids, and they are extensively employed in the treatment of syphilis.

Therapeutic Indications.

As an *absorbent* in chronic inflammations, as pleurisy, bronchitis, adenitis, arteritis, aneurysm, asthma, emphysema, and chronic rheumatism.

As an *antisymphilitic* in the late secondary and the tertiary manifestations.

Administration.—The iodids should never be given in dry form, but always in well-diluted solution.

In syphilis the dose must be steadily increased. To

facilitate this the drug is dissolved in water, so that 1 minim of the solution is equal to $\frac{1}{2}$ grain of the iodid.

The iodids are useful in the treatment of poisoning by arsenic and lead.

Toxicology.—Prolonged use of the iodids produce a series of symptoms to which the term *iodism* is applied. They are nausea, vomiting, and signs of dyspepsia, running and watering of the eyes, nose, and mouth. The writer has known three doses of 5 grains each to have produced in an adult profuse watering of the eyes and nose. Skin eruptions are common, also are anemia, loss of flesh, wasting of the breasts, and melancholia.

POTASSIUM NITRATE

Synonyms.—Saltpeter, Niter.

Dosage.—3–5 grains.

This salt produces *gastro-intestinal irritation* and *cardiac depression*. It is a slight *diuretic* and an *anti-spasmodic*. For this last action it is used in the treatment of asthma by inhaling the fumes from burning paper, which has been immersed in a 20 per cent. watery solution of saltpeter and then dried.

POTASSIUM PERMANGANATE

(See under *Manganese Compounds*)

POTASSIUM AND SODIUM TARTRATE

Synonym.—Rochelle Salt.

Dosage.—Up to 1 ounce.

The action is the same as of Potassium Bitartrate.

Preparation.

Compound Effervescing Powder (Seidlitz Powder).

—This contains: (a) 40 grains of sodium bicarbonate and 2 drams of Rochelle salt; (b) 35 grains of tartaric acid. Dissolve each powder—(a) and (b)—in water, mix, and drink while effervescing.

PRUNUS VIRGINIANA (*)**QUASSIA (*)****QUININ SALTS**
(See under *Cinchona*)**RESORCIN**

Properties.—A coal-tar product of the carbolic acid class, occurring in fine pinkish crystals, soluble in water (freely) and alcohol.

Dosage.—1–3 grains.

Action and Use.

Antiseptic.—Resorcin is a strong antiseptic, and is used as such in cystitis (as an irrigation), gastric fermentation, cholera, diarrhea, and parasitic skin diseases.

Antipyretic.—Resorcin will reduce a febrile temperature, but is too dangerous to be used as such.

Resorcin has a special action in keratotic and scaly diseases of the skin, in which it very quickly removes the horny scales. It is used in eczema, psoriasis, dandruff, and other scaly affections.

RHUBARB

Derivation.—The root of *Rheum Officinale*.

Synonym.—Rheum.

Dosage.—3–20 grains.

Preparations.

Extract.—Dose, 1–5 grains.

Fluidextract.—Dose, 3–20 minims.

Tincture.—Dose, 1–4 drams.

Aromatic Tincture.—Dose, $\frac{1}{2}$ –2 drams.

Sweet Tincture.—Dose, 1–4 drams.

Mixture of Rhubarb and Soda.—Dose, 1–8 drams.

Syrup.—Dose, 1–4 drams.

Aromatic Syrup.—Dose, $\frac{1}{2}$ –2 drams.

Compound Powder (Gregory's Powder).—Dose,
15–60 grains.

Physiologic Action.

Stomachic.—Taken internally, rhubarb stimulates both the motor and secretory powers of the stomach and sharpens the appetite.

Cathartic.—In the intestines it stimulates peristalsis, causing free bowel movements, usually attended with griping.

Astringent.—Owing to the large amount of tannic acid, rhubarb decreases the intestinal secretions and constipation follows the cathartic action.

Therapeutic Indications.

As a *stomachic* in atonic dyspepsia, flatulence, anorexia, and during convalescence.

As a *cathartic*, when it is desirable to empty the bowels and then have them rest, as in diarrhea of children, fermentative diarrhea, and biliousness.

Administration.—Rhubarb is seldom given alone on account of its griping, but is combined with other laxatives and correctives.

Rhubarb may cause the urine to become dark yellow or red in color.

SACCHARIN (*)

SALICYLIC ACID COMPOUNDS

SALICYLIC ACID

Derivation.—A constituent of such plants as wintergreen and sweet birch, from which it is obtained. It is also extensively prepared from carbolic acid.

Incompatibilities.—Spirit of nitrous ether, iron salts, and potassium iodid.

Properties.—A white, fluffy, crystalline powder, soluble in water (500 parts), alcohol (3 parts), olive oil (125 parts). It is odorless and has a sweet taste.

Dosage.—5–30 grains.

SALICYLATES

Cinchonidin Salicylate.—Dose, 1–10 grains.

Lithium Salicylate.—Dose, 1–10 grains.

Methyl Salicylate.—Artificial oil of wintergreen.

Sodium Salicylate.—Dose, 5–30 grains.

SALOL

A product of the action of carbolic acid on salicylic acid. It is insoluble in water. Dose, 1–10 grains.

SALICIN

A glucosid derived from willow bark. It is a white, bitter, crystalline powder, soluble in water. Dose, 5–30 grains.

SALOPHEN

A white, scaly powder, without odor or taste, and insoluble in water. Dose, 5–15 grains.

ASPIRIN

Synonym.—Aspirin is very frequently referred to by its technical name, acetylsalicylic acid.

This preparation is decomposed by water or sodium bicarbonate, and should be given in dry form. Dose, 5–15 grains.

Physiologic Action of Salicylic Acid Compounds.

Antiseptic.—Salicylic acid externally and the salicylates internally act as antiseptics.

Anhidrotic.—Applied to the skin, salicylic acid hardens it and prevents excessive sweating.

Cardiac Depressant.—Internally these compounds decrease the cardiac force, and in large doses are distinctly depressing.

Antipyretic.—The salicylates lower febrile temperature.

Antirheumatic.—For this action the salicylates are mostly employed. They relieve the pain, lower the fever, and slow the pulse.

Therapeutic Indications.

As an *anhidrotic* the acid is used as a dusting-powder for sweating feet and perspiring axillæ.

As an *antiseptic* the salicylates and salol are used in gastric fermentation, flatulent dyspepsia, typhoid fever, and diarrhea.

As an *antipyretic* in rheumatism and influenza.

As an *antirheumatic* and *antineuralgic* they are most frequently employed, being very valuable in rheumatism, neuralgia, migraine, and tonsillitis.

Salicylic acid is much used for its power of removing exuberant tissue, as corns, callosities, warts, and in scaly eczema and psoriasis.

Administration.—The salicylates and salicylic acid,

on account of their disagreeable taste, should be given in capsules, konseals, or tablet form.

In rheumatism any of the salicylic compounds are useful. Sodium bicarbonate, potassium citrate, or some alkaline salt should be combined with the salicylate to aid in its action and to prevent cardiac complications.

As an intestinal antiseptic, salol is preferable. In neuralgic conditions, salicin, salophen, or salol are good.

Pretoxic Signs.—Ringing in the ears, fulness of the head, headache, and obtunded hearing.

Toxicology.—During the use of the salicylic compounds a set of symptoms may occur to which the term *salicylism* is applied. They are flushed face, nausea, dyspepsia, deafness, dimness of vision, weak pulse, and delirium. The writer has had small doses of sodium salicylate produce great delirium in rheumatic patients.

SALVARSAN

This is one of the most efficient of the new arsenical preparations. It is known to some as "606." It is soluble in water and easily deteriorates when exposed to the air.

Salvarsan is used very extensively in the treatment of syphilis, particularly in the early stages. It has also been employed to cure frambesia or yaws. It may be given under the skin, in the muscle, or intravenously. This last is to be preferred.

Usually from 3 to 9 grains of salvarsan made into a dilute solution with normal saline is given into a vein.

Some very severe after-effects have been noted in the use of this drug.

Neosalvarsan, which differs a trifle from salvarsan, is as efficient as the latter drug, but is said not to be so toxic.

SANTAL WOOD (*)

SANTONIN (*)

SAVIN (*)

SCAMMONY (*)

SCOPARIUS

Derivation.—The tops of *Cytisus Scoparius*.

Synonym.—Broom Top.

Constituent.—Sparteïn.

Dosage.—10–60 grains.

Preparations.

Fluidextract.—Dose, 10–60 minims.

Sparteïn Sulphate.—Dose, $\frac{1}{8}$ – $\frac{1}{2}$ grain.

Physiologic Action.

Diuretic.—Scoparius taken internally acts upon the kidneys and increases the amount of urine.

Cardiac Stimulant.—Sparteïn represents the heart-stimulating part of scoparius. It acts especially on the nervous mechanism of the heart, causing a slow, forcible heart action.

Therapeutic Indications.

As a *diuretic* in dropsy of cardiac origin.

As a *stimulant* in heart affections due to disturbance of the nervous mechanism, as palpitation, tobacco heart, coffee- and tea-drinker's heart.

SENEGA (*)

SENNA (*)

SILVER NITRATE

Synonyms.—Argenti Nitras, Lunar Caustic.

Dosage.— $\frac{1}{8}$ – $\frac{1}{2}$ grain.

Preparations.

Dilute Silver Nitrate.

Fused Silver Nitrate.—Lunar caustic stick.

Action and Use.

Astringent and Caustic.—Applied externally silver nitrate causes an astringent effect, followed by destruction of tissue. It is used for these actions in stopping bleeding and for removing warts and vegetations.

Antiseptic.—Silver nitrate in dilute solution is a strong antiseptic, and is employed in gonorrheal urethritis and ophthalmia neonatorum.

Internally silver nitrate is used in gastritis, gastric ulcer, chronic diarrhea, and epilepsy.

Administration.—In gastric diseases this drug should be given when the stomach is empty, and followed by a large draught of water.

Toxicology.—*Acute Poisoning.*—The symptoms are burning pain in the abdomen, vomiting, catharsis, spasms, and collapse.

Management.—Give emetics, especially using salt water. Give white of egg, milk, and broths.

Chronic Poisoning.—This is termed *Argyria*, and is characterized by dyspepsia, gray discoloration of the skin and mucous membranes, anemia, and ulcerations.

SODIUM COMPOUNDS

SODIUM ARSENATE

Same action as Arsenic (which see). Dose, $\frac{1}{40}$ – $\frac{1}{20}$ grain.

SODIUM BENZOATE

See Benzoin Compounds. Dose, 5–60 grains.

SODIUM BICARBONATE

Synonyms.—Saleratus, Baking Soda.

Dosage.—10–120 grains.

Action and Use.

Given before meals it increases the flow of the gastric juice, given after meals it neutralizes the acid of the gastric secretion. It is used after meals for acid gastritis, pyrosis, and vomiting. This salt tends to render the urine alkaline, and is used in cystitis.

Externally it is a sedative, and is employed in burns and for itching.

SODIUM BORATE

Also known as Borax. (See Boric Acid.)

SODIUM BROMID

Same action and uses as potassium bromid, **except** that the sodium salt is less irritating. Dose, 10–60 grains.

SODIUM CITRATE

The author has found this salt of great value in the preparation of modified milk for infant feeding. It is supposed to cause the coagulation of milk to take place in the stomach, with the formation of soft, fine curds resembling closely the coagula of mother's milk. The sodium citrate is added to the milk mixture in the proportion of 1 grain of the salt to each ounce of the feeding mixture.

The solution of sodium citrate is locally used in the treatment of wounds.

SODIUM HYDRATE

Synonyms.—Caustic Soda, Sodium Hydroxid, Soda.

Action and Use.

Applied externally this preparation is a strong irritant and caustic. It is but little used as a caustic.

SODIUM IODID

Same action and uses as Potassium Iodid (which see). Dose, 5–60 grains.

SODIUM NITRITE

Same action and uses as Nitroglycerin, except the action of the nitrite is slower and more prolonged.

Dose, $\frac{1}{2}$ –2 grains.

SODIUM PHOSPHATE

This salt is considered under Phosphorus Compounds.

SODIUM SALICYLATE

See Salicylic Acid Compounds. Dose, 5–30 grains.

SODIUM SULPHATE

Synonym.—Glauber's Salt.

Dosage.—1–8 drams.

Sodium sulphate is a strong saline cathartic.

SODIUM SULPHITE

This drug is used as a gastro-intestinal antiseptic in gastric fermentation and also employed locally in parasitic skin diseases.

Dosage.—5–30 grains.

SODIUM THIOSULPHATE

Synonym.—Sodium Hyposulphite.

The action of this drug is the same as that of the sulphite, and is used in the treatment of parasitic skin diseases.

SQUILL

Derivation.—The bulb of *Urginea Maritima*.

Synonyms.—Scilla, Sea Onion.

Dosage.—1-5 grains.

Preparations.

Fluidextract.—Dose, 1-5 minims.

Tincture.—Dose, 5-20 minims.

Vinegar.—Dose, 5-40 minims.

Syrup.—Dose, 15-60 minims.

Compound Syrup.—Dose, 5-30 minims. Also known as Hive Syrup. (See under Antimony and Potassium Tartrate.)

Physiologic Action.

Gastro-intestinal Irritant.—Squill in moderate doses produces nausea and vomiting.

Expectorant.—This drug is a powerful expectorant, causing increase of the bronchial mucus.

Cardiac Stimulant.—Squill acts very much like digitalis on the heart, producing a slow, powerful heart action.

Diuretic.—The kidneys are irritated and their vascularity increased by this drug, thus the flow of urine is increased.

Therapeutic Indications.

As an *expectorant* in the latter stage of acute bronchitis, chronic bronchitis, and laryngitis.

As a *diuretic* in cardiac dropsy, chronic nephritis, and fluid accumulations of the pleural and pericardial cavities.

STRAMONIUM (*)

STRONTIUM SALTS

The strontium salts used in medicine are the lactate, bromid, salicylate, and iodid. The last three have the same action and uses as the corresponding sodium salts.

Strontium lactate is said to decrease the amount of albumin in the urine of nephritis. Dose, 5–20 grains.

STROPHANTHUS

Derivation.—The seeds of *Strophanthus Hispidus*.

Constituent.—Strophanthin, a glucosid.

Preparations.

Tincture.—Dose, 2–10 minims.

Strophanthin.—Dose, $\frac{1}{200}$ – $\frac{1}{100}$ grain.

Action and Use.

This drug has the same action on the heart and kidneys as digitalis, except that it does not contract the vessels like digitalis. The uses are the same.

SULPHURIC ACID

Synonym.—Oil of Vitriol.

Properties.—A colorless, oily liquid, which is exceedingly corrosive. It contains 93 per cent. of absolute sulphuric acid.

Preparations.

Dilute Sulphuric Acid.—Dose, 5–20 minims, well diluted.

Aromatic Sulphuric Acid (Elixir of Vitriol) contains 20 per cent. of sulphuric acid and ginger and cinnamon. Dose, 5–20 minims.

Action and Use.

Externally the acid is an irritant and caustic.

Internally it checks the flow of gastric juice and acts in the intestines as an astringent.

It is used externally as a caustic to remove warts and small growths, and also as a dilute lotion for sweating. Internally it is employed in diarrhea.

Toxicology.—See Hydrochloric Acid.

SUPRARENAL SUBSTANCE

The active principle of the suprarenal, adrenal, or epirenal gland or capsule is a very useful medicinal agent.

Form.—This remedy is placed before the medical profession in numerous forms: As a dry or desiccated gland; as an extract of the gland; in the form of its principal constituent under one of many names, as adrenalin, suprarenalin, adnephrin, epinephrin, and hemo-statin.

Dosage.—Dried gland, 3–8 grains; Extract, $\frac{1}{4}$ –1 grain; Adrenalin (1 : 1000 solution), 5–15 minims.

Physiologic Action.

Applied locally, solutions of the gland will produce great constriction of the vessels of the mucous membranes or the broken skin, thus causing paleness of the parts; later, a secondary relaxation of the vessel walls takes place.

Given *internally* the drug also causes a constriction of the vessels and a great rise of blood-pressure. The power and force of the heart is increased.

Therapeutic Indications.

Locally in capillary hemorrhage and to render operations on the eye, nose, throat, and other parts bloodless. To check secretions and lessen turgescence in hay-fever, rhinitis, etc.

Internally as a stimulant in shock, collapse, and cardiac failure.

TERPIN HYDRATE (*)

THYMOL (*)

THYROID GLAND

Action.

Given *internally* thyroid extract produces, in large doses, a rapid heart, dyspnea, frontal headache, and trembling. A continuous use of the drug will produce anemia, loss of weight, and weakness.

Uses.

This gland is employed extensively in the treatment of cretinism, myxedema, simple goiter, and obesity. It is also useful in skin diseases, fractures, and slow union of bone.

Dosage.—Dried gland, 1-4 grains; Extract of the gland, $\frac{1}{4}$ -1 grain.

TRIONAL (*)

TURPENTINE OIL

Derivation.—An oil distilled from the oleoresin of turpentine. It is a volatile, clear oil with a pine-like odor.

Dosage.—5-30 minims.

Preparations.

Rectified Oil.—Dose, 5–30 minims.

Liniment.

Physiologic Action.

Rubefacient.—Turpentine applied externally is irritating and produces redness of the skin.

Antiseptic.—Externally and internally oil of turpentine will retard bacterial growth.

Stimulant.—Reflexly from the stomach this drug stimulates the heart. It also stimulates intestinal peristalsis.

Anthelmintic.—The various intestinal worms are killed or their expulsion effected by turpentine in moderate doses.

Diuretic.—Turpentine irritates and causes congestion of the kidneys, thus increasing the output of urine. It may even produce bloody urine and partial suppression of this excretion. It imparts a violet-like odor to the urine.

Expectorant.—This drug acts as a powerful expectorant.

Hemostatic.—By its action on the musculature of the blood-vessels it produces vascular constriction.

Therapeutic Indications.

As a *rubefacient* in rheumatism, pleurisy, bronchitis, and neuralgias.

As an *antiseptic* in cleansing ragged wounds and ulcers. Internally in typhoid fever.

As an *intestinal stimulant* in typhoid fever, pneumonia, and other conditions accompanied by tympanities.

As a *hemostatic* in gastric, intestinal, and uterine hemorrhage.

Administration.—As a relief for tympanities turpentine stupes are a most useful form of administration, also as enemata.

When giving turpentine either internally or externally a careful watch for toxic signs must be kept.

Turpentine is best given in capsules, as an emulsion, or dropped on sugar.

Toxicology.—Signs of poisoning are vomiting, purging, languor, unsteady gait, suppression of urine, hematuria, skin eruption, and collapse.

Management.—Empty the stomach and give demulcents, as gruels, flaxseed-tea, slippery elm solution. Stimulate if necessary.

UVA URSI (*)

VALERIAN

Derivation.—The root of *Valeriana Officinalis*.

Dosage.—10–30 grains.

Preparations.

Fluidextract.—Dose, 10–30 minims.

Tincture.—Dose, $\frac{1}{4}$ –1 dram.

Ammoniated Tincture.—Dose, $\frac{1}{4}$ –1 dram.

Ammonium Valerianate.—Dose, 1–5 grains.

Iron Valerianate.—Dose, 1–3 grains.

Quinin Valerianate.—Dose, 1–10 grains.

Sodium Valerianate.—Dose, 1–5 grains.

Zinc Valerianate.—Dose, $\frac{1}{2}$ –2 grains.

Physiologic Action.

Gastric Stimulant.—All valerian preparations increase the motor and secretory actions of the stomach and promote the appetite and digestion.

Nerve Sedative.—Valerian tends to quiet nerve

unrest and to relieve functional nervous excitability, for which purpose it is much used.

Therapeutic Indications.

The chief use of this drug is as a *nerve sedative* in such conditions as hysteria, nervousness, nervous insomnia, hypochondriasis, and the nervous disorders of pregnancy and the menopause.

VERATRUM VIRIDE

Derivation.—The rhizomes of *Veratrum Viride*.

Synonyms.—American or Green Hellebore.

Constituents.—Veratroidin and jervin.

Dosage.—1–3 grains.

Preparations.

Fluidextract.—Dose, 1–3 minims.

Tincture.—Dose, 5–15 minims (U. S. P., 1900).

Physiologic Action.

General Depressant.—This drug exerts a depressing action on the spinal cord; on the vasomotor system; on the heart, causing a weak and slow pulse.

Therapeutic Indications.

Veratrum viride is the best *heart sedative* for use in the adult, being employed for the same purposes in the adult as aconite is for children. It is useful in the beginning of acute infectious fevers when the pulse is full and bounding, as in pneumonia, erysipelas, and pyemia. It is also invaluable in the treatment of puerperal eclampsia, being given until the pulse is reduced to about 80 beats per minute.

Pretoxic Signs.—Slow pulse, nausea, and vomiting.

Toxicology.—Although this is a most virulent drug,

yet it is said that but few fatal cases of poisoning have resulted from its use. This is probably due to the emetic action of the drug, which eliminates it from the body when taken in toxic doses.

Signs of poisoning are nausea, vomiting, weak pulse, labored respirations, and cold, moist skin.

Management.—Empty the stomach and stimulate.

VIBURNUM (*)

ZINC COMPOUNDS

ZINC CARBONATE

In the impure state this preparation is known as *Calamine*, under which name it is much employed in irritating skin diseases.

ZINC CHLORID

A white, granular powder, which is very poisonous and caustic. It is also known as Zinc Butter. Used externally only.

ZINC OXID

A white, amorphous, tasteless, and insoluble powder. It is employed mostly in the form of an ointment.

ZINC SULPHATE

Also known as White Vitriol. Dose, $\frac{1}{4}$ –1 grain.

Physiologic Action of the Zinc Salts.

Caustic.—Zinc chlorid destroys tissues to which it is applied.

Astringent.—The sulphate especially acts as an astringent, both externally and internally.

Emetic.—Zinc sulphate is a rapid and reliable emetic, causing vomiting by its irritant action on the stomach walls.

Therapeutic Indications.

As a *caustic* in the treatment of warts, nevi, lupus, condylomata, and epitheliomata.

As an *astringent*, externally for ulcers of the indolent type, gonorrhea, leukorrhea, and moist skin diseases. Internally in diarrhea and night-sweats.

As an *emetic* in drug poisoning.

Toxicology.—Nausea, vomiting, abdominal colic, purging, and collapse.

Management.—Wash out the stomach. Give tannic acid and demulcents, as white of egg, milk, lime-water. Stimulate and give opium for pain.

OTHER ZINC PREPARATIONS

Zinc Bromid.—Same action and uses as Potassium Bromid. Dose, 1–3 grains.

Zinc Iodid.—Same action and uses as Potassium Iodid. Dose, 1–3 grains.

Zinc Permanganate.—Same action and uses as Potassium Permanganate.

Zinc Phosphid.—See under Phosphorus. Dose, $\frac{1}{20}$ – $\frac{1}{8}$ grain.

Zinc Sulphocarbolate (Zinc Phenolsulphonate).—See Carbolic Acid. Dose, 1–3 grains.

Zinc Valerianate.—See Valerian. Dose, $\frac{1}{2}$ –2 grains.

PART III.

DRUGS OF MINOR IMPORTANCE

Absinth (Wormwood, Absinthium).—Used as a *stomachic* in gastric atony and dyspepsia. It is also an *anthelmintic*. *Fluidextract*, 15–45 minims.

Acacia (Gum Arabic).—Used as a *demulcent* in the form of a mucilage.

Adonis Vernalis.—The action of this drug is *similar to digitalis*, producing a slow and powerful heart action and diuresis. *Fluidextract*, 1–2 minims; *Adonidin*, $\frac{1}{10}$ – $\frac{1}{5}$ grain.

Agaricin.—A derivative of agaric. It *decreases all secretions* and is used with good results in night-sweats. Dose, $\frac{1}{4}$ –1 grain.

Allspice (Pimenta).—Acts as a *stomachic* and *carminative* in dyspepsia, colic, and anorexia. *Fluidextract*, 5–30 minims.

Ammoniac.—A gum resin having *expectorant* and *antispasmodic* properties. Used in bronchitis, asthma, and also as an emmenagogue in amenorrhea. Dose, 5–15 grains.

Anise.—An *aromatic* and *carminative*. Used much to relieve flatulence and colic in children. *Powder*, 5–20 grains; *Oil*, 1–10 minims.

Apiol.—An oily liquid derived from parsley and used as a *diuretic* and *emmenagogue*. Dose, 1–5 minims.

Apocynum (Canadian Hemp).—A useful *diuretic* much employed in dropsy. *Extract*, $\frac{1}{2}$ –2 grains; *Fluidextract*, 2–10 minims.

Arnica.—Used externally in bruises and sprains, and internally as a *diuretic* and *diaphoretic*. *Fluidextract*, 5–15 minims; *Extract*, 1–3 grains; *Tincture*, 15–60 minims.

Asafetida.—This drug is much used as a *carminative*, *nerve sedative*, and *expectorant*. It is excellent to relieve flatulence and colic of infants, being given as an enema. Also used in tympanities of typhoid fever, in nervous disorders of the functional type, and bronchitis. *Tincture*, $\frac{1}{4}$ –1 dram; *Emulsion*, 1–4 drams.

Aspidium (Male fern, Filix mas).—Used extensively as an *anthelmintic* for tapeworms. Castor oil should not be administered when this drug has been given, as poisoning may result from absorption facilitated by the oil. *Oleoresin* or *Extract*, 1–2 drams.

Aspidosperma.—Used in dyspnea, asthma, and bronchitis. *Fluidextract*, $\frac{1}{4}$ –1 dram.

Balsam of Peru.—Used externally as a stimulant to indolent granulations and ulcers. As an *expectorant* in asthma, chronic bronchitis, and pulmonary tuberculosis. Dose, 5–15 minims.

Barium Chlorid.—This salt has a *similar action to digitalis*, producing a slow and forcible heart. It is used as an *alterative* in syphilis and scrofula. Dose, $\frac{1}{10}$ – $\frac{1}{4}$ grain.

Blue Cohosh (Caulophyllum).—Used as an *emmenagogue* and as a relief for dysmenorrhea. *Fluidextract*, 10–30 minims; *Caulophyllin*, 1–5 grains.

Boneset.—This is more or less of a favorite *diaphoretic* with the laity, and is employed to abort “colds,” bronchitis, and acute fevers. *Fluidextract*, 1–2 drams.

Buchu.—The principal action of this drug is its *sedative* action on the urinary passages, for which purpose it is used in cystitis and urethritis. It is also employed as a *diuretic* in dropsy. *Fluidextract*, $\frac{1}{4}$ –1 dram.

Cactus (Night-blooming Cereus, *Cereus Grandiflorus*).—Cactus is a most valuable *heart stimulant*, increasing both the rate and force of the heart, and is used in palpitation and as a substitute for digitalis. The drug also possesses *diuretic* power. *Fluidextract*, 2–5 minims.

Calamus (Sweet Flag).—This drug is chiefly used as a *carminative*, and as such acts well in post-operative and fermentative flatulence. *Fluidextract*, 5–30 minims.

Calumba (Columbo).—This drug is one of the best *bitters* and *stomachics* and, as a rule, is acceptable to patients. *Fluidextract*, 5–20 minims; *Tincture*, 1–2 drams.

Chamomile, German.—This drug is used as a *carminative* in flatulence and colic; as an *antispasmodic* in spasms of teething; as a *diaphoretic* in aborting “colds” and stimulating menstruation. *Fluidextract*, 15–60 minims.

Cantharides (Spanish Fly).—Externally this drug acts as a *rubefacient* and *vesicant*, and is used as such in neuralgias, meningitis, and pleurisy. Internally it is used as a diuretic and vesical stimulant. *Tincture*, 1–5 minims; *Cerate* and *Collodion*, for external use.

Cardamom.—Used principally as a *carminative* and

flavoring agent. *Fluidextract*, 5-15 minims; *Compound Tincture*, freely.

Cassia (Cinnamon).—This is used as a flavor. *Carminative* and *astringent* in dyspepsia, flatulence, and diarrhea. *Fluidextract*, 10-20 minims; *Oil*, 1-3 minims.

Catechu (Gambir).—This drug is a powerful and valuable *astringent*, both externally and internally. It is useful locally in tonsillitis, pharyngitis, spongy gums, gonorrhea, and leukorrhea. Internally in diarrhea. *Compound tincture*, 1-2 drams.

Caulophyllum.—See Blue Cohosh.

Celery (*Apium Graveolens*).—The seeds are used as a *carminative* and *nerve stimulant*. *Fluidextract*, 5-15 minims.

Cerium Oxalate.—This metallic preparation is principally used as an *anti-emetic* in vomiting of pregnancy, seasickness, and dyspepsia. It is said to be a cough sedative of some value, but as such the writer has seen no beneficial results. Dose, 1-5 grains.

Chaulmoogra Oil.—This substance is greatly praised in the treatment of leprosy. Arrest of the disease by the use of this drug has been frequently reported.

Chenopodium, also known as American wormseed, is most useful as an *anthelmintic*. It is particularly active against the hookworm and the round-worm. The dose of the oil is from 6 to 45 minims, given in three portions an hour apart. The administration of the oil of chenopodium as a worm medicine should be preceded and followed by a brisk cathartic, as magnesium sulphate or castor oil.

Chloralamid.—This preparation is extensively em-

ployed as an *hypnotic* in insomnia not accompanied by pain. Dose, 15-40 grains.

Chloralose.—This is another *hypnotic*. Dose, 3-10 grains.

Chrysarobin (Goa Powder).—This is a most excellent application in the treatment of psoriasis and other skin diseases. Used as an ointment or with collodion. This drug should not be applied near the eyes.

Cimicifuga (Black Cohosh, Black Snakeroot).—Acts as an *analgesic*, *antispasmodic*, and heart depressant. It is useful in chorea, rheumatism, neuralgia, asthma, and dysmenorrhea. *Fluidextract*, 15-45 minims; *Extract*, 1-5 grains.

Cinnamon.—See Cassia.

Citric Acid.—Used as a remedy for scurvy. Dose, 5-20 grains.

Cloves (Caryophyllus).—Used as a *carminative* and flavor. *Fluidextract*, 5-20 minims; *Oil*, 1-5 minims.

Cocculus.—Important because of its principal constituent, *Picrotoxin*, which is employed in night-sweats. Dose, $\frac{1}{60}$ — $\frac{1}{15}$ grain.

Coley's Fluid.—This is a combination of the products of growth of the streptococcus and the *Bacillus prodigiosus*. It has been employed in the treatment of sarcoma. It is administered with an antitoxin syringe.

Colocynth.—This drug is a powerful hydragogue *cathartic*. It is always used in combination with other drugs. Dose, 1-8 grains. *Extract*, $\frac{1}{2}$ -2 grains; *Colocynthin*, $\frac{1}{8}$ — $\frac{1}{4}$ grain.

Conium (Hemlock).—This drug is a *motor depressant* and is used in chorea, neuralgias, convulsions, and

asthma. Dose, 1-3 grains; *Extract*, $\frac{1}{2}$ -2 grains; *Fluid-extract*, 1-5 minims; *Coniin*, $\frac{1}{60}$ - $\frac{1}{20}$ grain.

Copaiba.—Its chief uses are as an *expectorant* and *urinary stimulant*. Used in bronchitis, cystitis, gonorrhea, and leukorrhea. *Oil*, 5-10 minims; *Mass*, 5-45 grains; *Resin*, 5-10 grains.

Copper Compounds.—The *arsenite* is used in anemia, diarrhea, cholera infantum, typhoid fever, and dysentery. The *sulphate* is employed locally as an *astringent* and *caustic* in the treatment of ulcers, gonorrhea, warts, trachoma, and oozing of blood. Internally as an *emetic* and *astringent*. *Arsenite*, $\frac{1}{200}$ - $\frac{1}{100}$ grain; *Sulphate*, $\frac{1}{6}$ -2 grains.

Corn-silk (*Zea Mays*).—Used as a *diuretic* and *sedative* to the urinary tract. Employed in cystitis, leukorrhea, and gonorrhea. *Fluidextract*, $\frac{1}{2}$ -2 drams.

Couch Grass (*Triticum*).—Uses and dosage the same as for Corn-silk.

Creolin is a *deodorant* and *antiseptic*. Used as an irrigant and douche in washing out cavities, and in cystitis, leukorrhea, and gonorrhea. With water it forms a milky and soapy solution. Employed in solution of $\frac{1}{2}$ -2 per cent.

Croton Chloral (Butyl Chloral Hydrate).—Used as an *analgesic*, especially in neuralgia of the fifth cranial nerve or tic doloreaux. Dose, 2-5 grains, given every half hour until relief is obtained; or 15 grains in one dose.

Cubebs acts as a *diuretic*, *expectorant*, and *vesical stimulant*. Used in chronic bronchitis, pharyngitis, cystitis, and urethritis. *Fluidextract*, 10-60 minims; *Oil*, 5-10 minims; *Oleoresin*, 5-20 minims; *Tincture*, 1-2 drams.

Cusso (Koussou).—An excellent *anthelmintic* in the treatment of tapeworm. Dose, 1–4 drams; *Fluid-extract*, 1–4 drams.

Duboisin.—Used exclusively as a *mydriatic* and *nerve sedative*. It is employed largely in place of atropin, as the former is more rapid in its action, less irritating, and more transient. As a nerve sedative it is used to quiet insane patients. Dose, $\frac{1}{100}$ – $\frac{1}{40}$ grain.

Dulcamara (Bitter Sweet).—Said to be an *alterative*, *diuretic*, and *diaphoretic*, but is seldom used.

Echinacea.—Although an old drug, it has lately come to the front again, is much lauded as a powerful and efficient *alterative* in syphilis, and is very beneficial in the treatment of septic wounds, septicemia, and pyemia. *Fluidextract*, 10–30 minims.

Elaterium.—A powerful *hydragogue cathartic*, very useful in rapidly producing free bowel evacuations and in reducing dropsical accumulations. It is best given as *Elaterin*, dose, $\frac{1}{30}$ – $\frac{1}{15}$ grain. Dose of elaterium is $\frac{1}{10}$ – $\frac{1}{2}$ grain.

Erigeron Oil (Oil of Fleabane).—This drug is useful in stopping oozing of blood in hematuria, menorrhagia, hematemesis, etc. Dose, 5–10 minims.

Eriodictyon (Yerba Santa).—A very agreeable *expectorant* in bronchitis and asthma. On account of its taste it is used to cover the bitterness of quinin. Dose, 15–60 grains. *Fluidextract*, 15–60 minims; *Aromatic Syrup*, 1–3 drams.

Ethyl Bromid.—A clear, volatile, and inflammable liquid, used locally as an *anesthetic*. It is also employed as a general anesthetic.

Ethyl Chlorid.—A local and general *anesthetic*.

Eucain.—A substitute for cocain as a *local anesthetic*. Used as a 2–10 per cent. solution.

Eucalyptus is an *antiperiodic*, *antiseptic*, and *expectorant*. Employed in malaria, asthma, and bronchitis. *Oil*, 5–10 minims; *Fluidextract*, $\frac{1}{4}$ –1 dram; *Eucalyptol*, 5–10 minims.

Euonymus (Wahoo).—Used principally as a *chologogue cathartic* in jaundice, hepatitis, biliousness, and malaria. *Extract*, 1–5 grains; *Fluidextract*, 1–2 drams.

Eupatorium.—See Boneset.

Fennel.—Used as a *carminative* in flatulence and infantile colic. *Fluidextract*, 5–20 minims.

Frangula (Buckthorn).—A mild and pleasant *laxative*, used much in chronic constipation. *Fluidextract*, 15–30 minims; *Extract*, 5–15 grains.

Gamboge.—An uncertain *hydragogue cathartic*, attended with griping. Dose, 1–4 grains.

Gossypii Radicis Cortex (Cotton-root Bark) is an *emmenagogue* and oxytocic. Used in amenorrhea and dysmenorrhea. *Fluidextract*, 15–60 minims; *Extract*, 1–10 grains.

Grindelia is an *expectorant* and *antispasmodic*, used in asthma, whooping-cough, and hay-fever. The fluid-extract is an excellent application for ivy-poisoning. *Fluidextract*, $\frac{1}{4}$ –1 dram.

Guaiac.—A *diaphoretic* and *antirheumatic*. Used in subacute and chronic rheumatism, tonsillitis, pharyngitis, amenorrhea, and dysmenorrhea. Dose, 5–15 grains. *Tincture*, $\frac{1}{4}$ –1 dram; *Ammoniated Tincture*, 1–2 drams.

Hamamelis (Witch Hazel).—Used mostly as an *astringent* and *hemostatic* in piles, diarrhea, leukorrhea, and gonorrhea. *Fluidextract*, $\frac{1}{4}$ –1 dram.

Helonias (False Unicorn Root).—Used as a *uterine sedative* and *tonic*. *Fluidextract*, $\frac{1}{2}$ –2 drams.

Hematoxylon (Log Wood).—Used as an *astringent* in diarrhea, dysentery, and cholera infantum. *Extract*, 5–15 grains.

Humulus (Hops).—This drug acts as a *nerve sedative* and *hypnotic*. *Fluidextract*, $\frac{1}{4}$ –1 dram; *Tincture*, 1–3 drams; *Lupulin*, 2–10 grains; *Fluidextract of Lupulin*, 2–15 minims.

Ingluvin (Extract of Chicken Gizzard).—Used as a *digestant* and *anti-emetic*. Dose, 5–20 grains.

Iris (Blue Flag).—A *cholagogue cathartic*, used in hepatic torpor and biliousness. *Extract*, 1–4 grains; *Fluidextract*, 5–20 minims; *Irisin*, $\frac{1}{2}$ –3 grains.

Jamaica Dogwood (Piscidia).—*Nerve sedative* and *hypnotic*. *Fluidextract*, $\frac{1}{4}$ –1 dram.

Juniper.—A stimulating *diuretic*, not to be used in acutely congested nephritis. *Fluidextract*, 1–2 drams; *Spirit*, $\frac{1}{2}$ –1 dram; *Oil*, 2–10 minims.

Kamala.—Used as an *anthelmintic* for tapeworm. *Fluidextract*, 1–20 drams.

Kava Kava.—Useful in mucous-membrane inflammations, as bronchitis, cystitis, and gonorrhea. *Fluidextract*, $\frac{1}{4}$ –1 dram.

Kino.—Very useful *astringent* in diarrhea. *Tincture*, 1–3 drams.

Kola (Cola).—*Nerve sedative* and *astringent*. *Fluidextract*, $\frac{1}{4}$ – $\frac{1}{2}$ dram.

Krameria (Rhatany).—Strong *astringent* and hemostatic. Used in diarrhea, sweating, leukorrhea, and bleeding from the mucous membranes. *Fluidextract*, 10–30 minims; *Tincture*, 1–3 drams; *Syrup*, 1–3 drams.

Lactucarium (Lettuce).—*Hypnotic* and *nerve sedative*. *Fluidextract*, 5–15 minims.

Lanum (Lanolin, Hydrous Wool-fat).—Used as a base for ointments.

Leptandra (Culver's Root).—*Cholagogue cathartic*, used in constipation, jaundice, and hepatic torpor. *Extract*, 3–10 grains; *Fluidextract*, 15–45 minims; *Leptandrin*, 1–5 grains.

Lobelia.—Used as an *expectorant* and *antispasmodic* in asthma, chronic bronchitis, whooping-cough, and spasmodic conditions. *Fluidextract*, 2–10 minims; *Tincture*, 10–30 minims; *Lobelin Sulphate*, $\frac{1}{2}$ –2 grains.

Methylene-blue.—Used as an *antiperiodic* in malaria and as an *antiseptic* in the treatment of gonorrhea and cystitis. This drug causes the urine to become of a blue-green color. Dose, 1–4 grains, in capsules.

Musk.—This drug is of animal origin. It acts as an *antispasmodic* and *stimulant* in low nervous conditions of the acute fevers. The drug is extremely expensive. Dose, 3–10 grains; *Tincture*, $\frac{1}{2}$ –1 dram.

Musk Root (Sumbul).—Used exclusively as a *nerve sedative* in hysteria, nervousness, and insomnia. *Fluidextract*, 10–20 minims.

Mustard (Sinapis).—Acts as a *rubefacient*, counter-irritant, and *emetic*.

Myrrh.—*Astringent*, *carminative*, and *emmenagogue*. Useful for spongy gums, stomatitis, amenorrhea, and chlorosis. *Tincture*, 15–60 minims.

Naphtol.—Used as an *intestinal antiseptic* in diarrhea, typhoid fever, cholera infantum, and enteritis. Dose: *Alpha*, 1–8 grains; *Beta*, 5–15 grains.

Paraldehyd.—Used as an *hypnotic*. The taste is so disagreeable that it should be given well diluted in sweetened water. Dose, $\frac{1}{2}$ –1 dram.

Passion Flower (*Passiflora*).—Used as a *nerve sedative* in hysteria, nervousness, and insomnia. *Fluid-extract*, $\frac{1}{4}$ –1 dram.

Phytolacca (Poke Root or Berry).—Used as an *alterative* in syphilis, rheumatism, and scrofula. Recently has been employed in obesity. Dose, 1–5 grains. *Fluidextract*, 1–5 minims.

Picrotoxin.—See *Cocculus*.

Prunus Virginiana (Wild Cherry).—Used as a *cough sedative* and *expectorant*. *Fluidextract*, $\frac{1}{4}$ –1 dram; *Syrup*, 1–4 drams; *Infusion*, $\frac{1}{2}$ –2 ounces.

Pumpkin Seeds (*Pepo*).—Used as an *anthelmintic* for tapeworm. Dose, 1 ounce.

Quassia.—A *bitter* and *anthelmintic*. Used in anorexia, dyspepsia, and gastric atony. As an enema for seat- or pin-worms. *Fluidextract*, 10–30 minims; *Tincture*, 1–3 drams; *Infusion* (as enema), 1–2 ounces.

Saccharin (*Glusid*).—This is a coal-tar product with an intensely sweet taste. It is employed as a substitute for sugar in diabetic patients. One grain is equivalent in sweetening power to 1 ounce of sugar.

Saffron.—Used formerly as an antispasmodic and emmenagogue.

Sanguinaria (Blood Root).—Used as an *expectorant* in bronchitis, croup, and asthma. *Fluidextract*, 3–15 minims; *Tincture*, $\frac{1}{4}$ –1 dram; *Sanguinarin*, $\frac{1}{12}$ – $\frac{1}{4}$ grain.

Santal Wood (Sandal Wood).—Used as an *anti-*

septic and stimulant to the urinary tract in cystitis and gonorrhea. *Fluidextract*, $\frac{1}{4}$ -1 dram; *Oil*, 5-20 minims.

Santonica (Levant Worm-seed).—Used as an *anthelmintic* for the round-worm. *Santonin*, $\frac{1}{4}$ -2 grains.

Savin.—*Emmenagogue* in amenorrhea. *Oil*, 1-5 minims.

Saw Palmetto.—*Bronchial and urinary stimulant*. Used in bronchitis, asthma, laryngitis, cystitis, and gonorrhea. This drug is said to produce an increase in weight and nutrition. Dose, $\frac{1}{2}$ -1 dram; *Fluidextract*, $\frac{1}{2}$ -1 dram.

Scammony.—*Hydragogue cathartic*, similar to jalap. *Resin*, 1-5 grains.

Senega acts as an *expectorant* and *diuretic*. Used in chronic bronchitis, asthma, croup, and dropsy. *Fluidextract*, 10-20 minims; *Syrup*, $\frac{1}{2}$ -2 drams.

Senna.—Chief action is that of a *laxative*. *Fluidextract*, 1-2 drams; *Compound Infusion* (Black Draught), 1-2 ounces.

Spigelia (Pink Root).—Used as an *anthelmintic* for the round-worm. *Fluidextract*, 1-2 drams.

Stavesacre (Staphisagria, Delphinium).—Used principally as an *antiparasiticide*. It is very poisonous.

Stramonium.—This drug is a powerful *antispasmodic*, belonging to the same class as belladonna and hyoscyamus. Used particularly in asthma by inhaling the vapors from the burning leaves. *Fluidextract*, 1-5 minims; *Tincture*, 5-15 minims.

Sulfonal.—Used as an *hypnotic*. Dose, 10-30 grains.

Sulfur.—Used as a *disinfectant* by burning. Internally it is a *laxative*. *Precipitated Sulfur*, $\frac{1}{2}$ -1 dram.

Terpin Hydrate.—Useful in chronic bronchitis, hay-fever, and cystitis. Dose, 2–5 grains.

Thymol.—*Antiseptic* and *anthelmintic*. Used in typhoid fever, gastric fermentation, bronchitis, and coryza. It is also employed in the treatment of intestinal worms, especially the hookworms. For this purpose it is often given in doses as large as 60 grains.

Tolu.—Used as an *expectorant*. Syrup, 1–4 drams.

Trional.—Used as a *hypnotic* in insomnia not accompanied by pain. Dose, 10–30 grains.

Uva Ursi (Bear-berry).—Acts as a *diuretic* and stimulant to the urinary tract. Used in chronic nephritis, cystitis, and gonorrhea. *Fluidextract*, $\frac{1}{4}$ –1 dram; *Arbutin*, 2–7 grains.

Viburnum Prunifolium (Black Haw).—Used principally as a *uterine antispasmodic* in dysmenorrhea, threatened abortion, and habitual miscarriages. *Fluidextract*, $\frac{1}{4}$ –1 dram.

Viburnum Opulus (Cramp Bark).—Used as a *nerve sedative* and *antispasmodic* in asthma, hysteria, and nervousness of women.

PART IV

NEWER MEDICINAL AGENTS

THIS section refers to the newer definite chemic products and not to the multitude of medicinal mixtures, the ingredients of which are more or less undivulged.

Acetozone.—One of the organic peroxids, claimed to be a powerful germicide. It is soluble in water, is non-explosive, and does not corrode tissues or act toxic internally. It is used locally for ulcers, rhinitis, leukorrhea, and internally in typhoid fever, diarrhea, and fermentative dyspepsia.

Dosage.—Internally it is administered greatly diluted. Two grains or more of the drug are dissolved in a glass of water and this amount taken every two hours. Externally it is used as a dusting-powder, mixed with boric acid, talcum, or other inert powder, or a solution of 1 : 2000 is used as a lotion or douche.

Actol (Silver Lactate).—This is an organic silver salt. It is a white powder, soluble in 15 parts of water. It acts as an astringent and antiseptic. Like other silver salts, it is especially valuable in those conditions due to the gonococcus. It may be employed sub-

cutaneously in erysipelas. Dose, $\frac{1}{4}$ – $\frac{3}{4}$ grain. As an irrigant in a 1 : 2000 solution.

Agurin (Acetothobromin Sodium).—A white powder, soluble in water. Used as a diuretic for reducing dropsical accumulations due to cardiac or renal disease. Dose, 7–14 grains.

Airol.—An iodine preparation of bismuth and gallic acid. Used as a dressing powder for ulcers, wounds, skin diseases, and affections of the nose, ear, and throat. It has been used internally for diarrhea in doses of from 1–3 grains.

Albargin (Gelatos Silver).—An organic silver preparation containing 15 per cent. of silver and soluble in water. Used in gonorrheal affections.

Alphozone (Succinic Peroxid).—An organic peroxid somewhat similar to acetozone in action and uses.

Amyloform.—A combination of formaldehyd and starch. Used as a substitute for iodoform. It does not irritate or cause toxic symptoms.

Anesthol.—A clear and transparent liquid with an agreeable odor. It is used as an anesthetic, being a combination of ethyl chlorid, ether, and chloroform.

Argenol.—A combination of silver and an albuminous substance. Soluble in water and used as other organic silver combinations.

Argentamin.—A solution of 10 per cent. of silver in organic combination. It is non-irritating, very penetrating, and stronger than silver nitrate. Used in gonorrheal diseases in solutions of 1 : 100 to 1 : 400.

Argyrol.—A combination of silver and yelk of egg. Used in solution of 0.1–4 per cent. strength.

Aristochin.—A tasteless quinin preparation. Dose same as Quinin.

Aristol.—A derivative of thymol and iodine. * Used as a dressing for wounds, ulcers, burns, etc. It should be protected from the light.

Atoxyl.—This chemical belongs to the group of later arsenical preparations. It is known as sodium arsanilate. It is less toxic than the older salts of arsenic and its action in certain diseases is much to be preferred. In trypanosomiasis or sleeping sickness it has proved very valuable. Manson gives 2 or 3 grains as an intramuscular injection every alternate day. Others prefer giving a dose of $7\frac{1}{2}$ grains every five or ten days. It has also been used to replace salvarsan in the treatment of syphilis.

Benzosol.—A guaiacol-benzoin combination, containing 54 per cent. of guaiacol. Used as an intestinal antiseptic. Dose, 1–10 grains.

Bromoform.—A bromine derivative, used especially in the treatment of whooping-cough. Dose, 1–10 drops. Its use is not free from danger.

Chloretone.—A derivative of chloroform and acetone. Used as an hypnotic and anesthetic. Dose, 5–15 grains.

Collargol is a soluble metallic silver used in septic conditions, as puerperal fever, pyemia, erysipelas, and all infectious conditions. Administered intravenously, 30 minims of a 5 per cent. solution, well diluted; by rectum, 5 grains in 1 ounce of water; by mouth, tablets of 1 or 2 grains; local application, varying from $\frac{1}{2}$ –5 per cent. solution. Unguentum Cr  d   is a 15 per cent. ointment of collargol.

Diuretin.—A combination of sodium salicylate and theobromin. Used as a diuretic in nephritis and dropsy. It should be given as a fresh solution in water. Not more than six doses of 15 grains each should be given in twenty-four hours.

Dolomol preparations are combinations of various medicaments with the stearate of calcium and magnesium.

Dormiol is a combination of chloral and amylene hydrates. Used as an hypnotic. Dose, 5–20 grains.

Eosote (Creosote Valerianate).—Used in tuberculosis and diarrheas. Dose, 1–10 minims.

Euquinin.—A tasteless quinin. Use and dosage the same as Quinin.

Exalgin.—An acetanilid derivative, used the same as Acetanilid. Dose, 1–4 grains.

Fluorescein.—Although not used therapeutically, it is of value in ocular diagnosis. If a watery solution of fluorescein is applied to the cornea and conjunctiva, ulcers or raw areas will appear as yellow or green spots and remain so for a few hours. Normal tissues are not stained.

Formin.—See Urotropin.

Geosote (Guaiacol Valerianate).—Used as an intestinal antiseptic and in tuberculosis. Dose, 3–10 minims.

Hedonal.—Used as an hypnotic in nervous insomnia. Best given in dry form or in capsules. Dose, 15–30 grains.

Helmitol.—Same action and use as Urotropin.

Holocain.—A substitute for cocain. Used in a 1 per cent. solution.

Hyrgol.—A colloidal preparation of mercury. Used

in syphilis and said not to interfere with digestion. Used as an inunction.

Ichthalbin.—A combination of ichthyol and albumin. Used same as Ichthyol. Dose, 3–10 grains, internally.

Ichthargan.—A combination of ichthyol and silver, and contains 30 per cent. of silver. Used in gonorrhoeal disease in a 0.2–3 per cent. solution.

Ichthoform.—A combination of ichthyol and formaldehyd. Used as an antiseptic both externally and internally. Dose, 10–30 grains.

Iodol.—An iodine derivative of 89 per cent. strength. Used as a substitute for iodoform.

Itrol (Silver Citrate).—Used the same as Actol.

Lycetol.—A compound of piperazine. Used in gout, lithemia, calculi, and chronic rheumatism. Dose, 4–10 grains.

Lysol.—A brown oily liquid, very similar in action and uses to creolin. Used in $\frac{1}{2}$ –2 per cent. solution.

Mesotan.—A salicylic acid derivative, used locally as an analgesic in rheumatism and neuralgias. Applied with an equal part of sweet oil.

Nosophen.—An iodine derivative of 60 per cent. strength. Used as a substitute for iodoform.

Orthoform.—A benzoic derivative with a local anesthetic action similar to cocaine. Used for burns, fissures, and painful wounds.

Perhydrol.—A 30 per cent. solution of hydrogen peroxid.

Phenolphthalein.—This chemical is very much used in the relief of chronic constipation. It may be given alone or in combination with some of the vegetable laxatives, as aloes or rhubarb. The average dose is $7\frac{1}{2}$ grains.

Picratol.—A picric acid derivative of silver, containing 30 per cent. of silver. Used as other silver preparations.

Piperazin.—Used as a uric-acid solvent in gout, lithemia, and rheumatism. Dose, 5 grains three times a day, dissolved in plenty of water.

Proferrin.—A nucleoproteid combination of iron. Used in anemia. Dose, 5–10 grains.

Protan.—A nucleoproteid combination of tannic acid. Used in diarrhea. Dose, 5–30 grains.

Protargol.—A combination of proteid with 8 per cent. of silver. Used as other organic silver preparations in a 0.2–10 per cent. solution.

Salipyrin (Antipyrin Salicylate).—Analgesic, antipyretic, and antirheumatic. Dose, 5–30 grains.

Scarlet Red.—This is one of the synthetic coal-tar preparations which has been extensively employed locally in the form of a 5 per cent. ointment in the treatment of sluggish and non-granulating ulcers. The author has seen some very good results from its use.

Stovain.—This drug is employed as a local anesthetic. It is not as toxic as cocain. In eye work a 4 per cent. solution is used.

Stypticin (Cotarnin Hydrochlorate).—A derivative of an alkaloid of opium (Narcotin). Locally or internally it causes vasoconstriction. Dose, 1–4 grains. Used in uterine hemorrhage, nosebleed, and hemoptysis.

Sublamin.—A mercurial derivative used as an antiseptic in place of mercury bichlorid. It is non-irritating. Used in 1 : 1000 to 1 : 500 solutions.

Tannalbin.—A combination of albumin and tannic acid. Used as an astringent in diarrheas. Dose, 10–60 grains.

Tannigen.—A tannic acid combination. Used as an intestinal astringent. Dose, 3–15 grains.

Tannocol.—A combination of tannic acid and gelatin. Dose, 7–15 grains.

Tannoform.—A combination of tannic acid and formaldehyd. Used in skin diseases and for local sweating.

Theocin.—A powerful diuretic, used in doses of 3–5 grains.

Thiocol.—A guaiacol derivative, used in tuberculosis, coughs, and as an intestinal antiseptic. Dose, 5–20 grains.

Thiosinamin.—A tissue solvent. Used in lupus, tumors, old scars, and strictures. Hypodermically, 1–3 grains, in a 15 per cent. alcoholic solution.

Tricresol.—A mixture of three cresols. Used as a disinfectant in $\frac{1}{2}$ –1 per cent. solution.

Urotropin (Hexamethyleneamin).—A powerful urinary antiseptic. In the kidneys it sets formalin free, thus converting the urine into an antiseptic solution. Used in cystitis, pyelitis, nephritis, urethritis, and typhoid fever. Dose, 5–7 grains, dissolved in water and given three times a day, after meals. Hexamethyleneamin is now an official preparation.

Veronal.—A hypnotic used in nervous insomnia. Dose, 5–12 grains, given in a hot drink.

Xeroform.—A substitute for iodoform. It is free from odor, taste, and irritation. Used internally as an intestinal antiseptic. Dose, 5–15 grains.

Yohimbin.—An alkaloid from the bark of Yohimbehe, grown in West Africa. Used in impotence. Dose, $\frac{1}{15}$ grain.

PART V

PRACTICAL THERAPEUTICS

HYDROTHERAPY

BATHS

IN the treatment of acute febrile diseases baths are used for two chief purposes: To reduce the fever; to impress the nervous system. This latter purpose is fully as important as the reduction of the temperature. Baths are instituted in the treatment of fever when the temperature of the patient reaches a certain height, generally 103° F., or when the nervous symptoms become marked. There are several varieties of baths, the best and most frequently employed methods are: Sponge-bath, tub-bath, bed-bath, and packs.

Sponge-bath.—This form of bathing is used when the fever is not excessive and is easily influenced, especially in the case of children and weak and nervous adults. The patient is placed on several thicknesses of blankets or on a rubber sheet. A sponge is moistened with water of the required temperature, which should be higher for the initial baths than for the subsequent ones; the moist sponge is now lightly applied

to the patient's body so as to leave a thin film of water on the skin, and not poured on from a dripping sponge, as is often the case. By applying only a thin film of water evaporation takes place rapidly and the temperature of the body falls correspondingly. It is very important that the surface of the body be kept glowing by constant rubbing with the hands to facilitate evaporation and to stimulate the surface circulation. In robust adults a very large part of the surface may be manipulated, but in weak adults and children it is preferable to bathe only a small part of the body at a time. If, after the sponge-bath is completed, alcohol be poured into the palms of the hands and then applied to the patient's body, a very agreeable and beneficial result is obtained. When the sponge-bath is finished the patient is covered with a light sheet.

Tub-bath.—This form of bath is used when the temperature is excessive and the patient is robust. The question as to the temperature of the water at the beginning of the bath is to be solved by the physician in attendance. The water may be warm at first, to prevent the initial shock, and then gradually cooled by cold water or ice to about 80° F., or the water may be employed at 80° F. at the beginning. Many physicians insist that this initial shock is beneficial.

The patient is placed on a stretcher made for the purpose, and is lowered into the tub, or is rolled on to a blanket and lowered into the tub. When in the water, friction should be constantly applied to the patient's body to maintain the surface circulation. As the bathing progresses the water, which is becoming

warmer, should be cooled by adding cold water or ice. An ice-cap placed on the patient's head will prevent the sometimes troublesome cerebral hyperemia. Before and, if necessary, after the tub-bath a diffusible stimulant, as aromatic spirit of ammonia, spirit of ether, or spirit of vini gallici, may be given.

The temperature of the patient should not be reduced below 100° F., as collapse may follow, because the temperature continues to fall several degrees after the bath is discontinued.

Bed-bath.—This form of bathing has the advantages of a tub-bath, and is devoid of the danger involved in handling the patient necessary in tub-bathing.

A large rubber sheet is placed under the patient, then two blankets are rolled up lengthwise into two bolsters; one of these rolls is placed under the rubber sheet on each side of and running parallel with the patient's body, in such a manner that he lies in the trough. A pillow is placed under the upper end of the rubber sheet and another pillow at the foot under the rubber sheet, thus a rubber bath-tub is improvised, with the patient in it. Water of the required temperature is now poured into the tub and the bath is continued as in a tub-bath. When the bath is completed, the water is allowed to flow into a pail which is held under the edge of the rubber cloth at the foot of the bed, where the pillow has been partially removed.

Packs.—These the writer considers one of the best methods of applying cold for the purpose of reducing the temperature of a fever patient. They are partial and complete.

First, place a rubber sheet under the patient to prevent the bedclothing from becoming wet. Next, wring out a sheet in cold water and wrap it about the patient's body from the chin to the toes. As the sheet becomes warm, pour cold water on from a pitcher or, better, from a sprinkling can. In the partial form, only the chest or the chest and abdomen are wrapped in the wet sheet.

A word here about the ice-bag will not be out of place.

Ice-bag.—This small, inexpensive, easily obtained, and, as some say (they do not know its value), insignificant piece of apparatus the author considers as the most valuable means of applying cold to a limited area. Not only is it useful in reducing the temperature, but in combating inflammation, preventing exudations, and in overcoming pain, especially in pleurisy, pericarditis, peritonitis, appendicitis, articular rheumatism, and, in fact, any inflammatory pain. This method is not employed as much as it should be.

HYPODERMOCLYSIS

This is another and equally important division of hydrotherapy.

Indications.—The subcutaneous injection of normal saline solution is a most valuable therapeutic agent. In the writer's hands the most gratifying results have been obtained by the use of hypodermoclysis. It will be found useful in those conditions characterized by a loss of body fluids, as hemorrhage and cholera. In circulatory depression of shock, surgical collapse, over-anesthetization, and acute fevers, as pneumonia and

typhoid fever. As an aid in the elimination of toxins and poisons in sepsis, septicemia, uremia, and diabetic coma.

Methods.—First, let us consider the solution for injection. By a normal saline or an isotonic solution we mean one which holds about as much saline material as the plasma of the blood, which is about 0.6 per cent. If to 1 quart of sterile water $1\frac{1}{2}$ drams of salt (sodium chlorid) be added we have approximately a 0.6 per cent. solution.

Apparatus.—The apparatus necessary is a glass funnel, sufficiently large to hold 1 quart, a rubber tube three feet long, and an aspirating needle. All parts must be absolutely sterile.

Site of Injection.—This may be any place where the subcutaneous cellular tissue is abundant, as below the breasts, the anterior abdominal wall, or the inner portion of the thigh.

Place the solution in the funnel and allow the water to escape until the air is forced from the tube and the needle and the apparatus is warm. Roll up the skin by pinching it between the thumb and index-finger of the left hand, then insert the needle as you would in giving a hypodermic injection, making sure that the end of the needle is under the skin and in the loose cellular tissue. The needle being in place, the solution is allowed to slowly enter the tissues by elevating the funnel. The absorption of the fluid may be facilitated by kneading the tumor formed in the skin. About 1 or 2 pints should be injected at one time. The temperature of the solution should be about 105° F.

ENTEROCLYSIS

This is literally a drenching of the bowels.

Indications.—In the treatment of diseases of the intestines; to supply fluid to the system; to add heat to the body; to abstract heat from the body; to wash out poisons eliminated through the intestinal mucous membrane; to reduce intestinal obstruction.

Treatment of Diseases of the Bowels.—Much success has followed the use of enteroclysis in the treatment of cholera. The bowels are washed out with 1 to 3 liters of normal saline solution or, better, with a 1 per cent. solution of tannic acid. The solution should be allowed to flow in slowly from a fountain-syringe held one or two feet above the patient. Dysentery is also efficiently treated by this means, using a 1 : 2500 solution of quinin, which rapidly destroys the ameba. Silver nitrate solutions (15 grains to the pint) are useful in subacute cases. In infantile bowel trouble, washing of the bowels with normal saline solution is most beneficial. Enteroclysis is also valuable in chronic diarrhea.

To Supply Fluid.—Enteroclysis, or rectal infusion of saline solution, is of great value in the same conditions as hypodermoclysis: In hemorrhage, shock, uremia, nephritis, diabetic coma, and diarrheas. After surgical procedures, when thirst is great but water is not allowed by mouth, a rectal infusion of 1 pint of saline solution is invaluable.

To Add Heat.—In shock, collapse, algid malaria, and conditions accompanied with a subnormal temperature a saline rectal infusion with a temperature of 100° F. will aid in the restoration of the normal body heat.

To Abstract Heat.—In high fever a rectal irrigation with cold water is advised. It will abstract heat rapidly and from parts where most of the heat is stored, but the method is not without danger.

To Eliminate Poisons.—In toxic conditions, when the poisons are eliminated through the mucous membrane of the intestines, the toxic products may be rapidly removed from the body with a normal saline irrigation of the colon.

In Intestinal Obstruction.—The obstacle may in some cases be removed by filling the bowel with saline solution under slight pressure, but with extreme care.

In conclusion, the writer wishes to state that in using large quantities of hot saline solution in the bowel you may raise the temperature of the body sufficiently high to produce heat-stroke.

GASTRIC LAVAGE

It is frequently necessary to wash out the stomach, especially in drug poisoning, diseases of the stomach, and in persistent vomiting. For this last purpose the writer has seen some excellent results in emesis after operations.

An ordinary stomach-tube with the funnel end is used. The tube is lubricated with warm water, not oil, glycerin, or vaselin, and then passed by directing the extremity well back toward the posterior pharyngeal wall and into the esophagus, when the patient is told to swallow, and the tube is passed into the stomach. If the stomach is empty, warm water is poured into the funnel and allowed to flow into the stomach. When 4 or 6 ounces of water have entered the organ

and before the funnel is empty the outer end is lowered into a basin placed on the floor, when the stomach is emptied by siphonage. This is repeated several times. A small amount of water may be allowed to remain in the stomach. In removing the tube have the lumen closed by pinching the tube between the fingers, thus preventing water escaping from the tube and entering the larynx, which would cause coughing and disagreeable symptoms.

HYPODERMIC MEDICATION

This is the most accurate method of administering drugs. If a drug be given by the stomach, the amount which is absorbed varies between wide margins depending on the condition of the stomach and its contents. Some drugs are altered while in the stomach. If a drug be given to a person hypodermically you can depend on a rapid and accurate action of the same. The dose of drugs when given subcutaneously is less than the dose by mouth.

A description of the hypodermic syringe is unnecessary. The number of different syringes on the market is legion. Many of them are good.

Site of Injection.—Any part of the cutaneous surface where the skin is thin and soft may be selected. If the skin be thick the procedure is painful to the patient, and during the manipulations the needle may be broken or bent. The site should be cleansed with alcohol on a soft and clean cloth.

Method.—The needle is placed in a large iron or agateware spoon containing water and vigorously boiled for a minute or two over a lamp or gas flame, then

draw the barrel of the syringe full of the hot water and throw away what water remains in the spoon, after having carefully removed the needle. Place the hypodermic tablet in the same spoon and eject upon it the water from the syringe, when the tablet will soon dissolve; then fill the syringe with this medicated solution and screw on the needle. Before giving the injection point the needle upward, and slowly press on the piston until a drop of the solution appears at the point of the needle and the air is expelled.

As said before, the injection may be given where the skin is thin and soft, as the inner surface of the arm toward the anterior or posterior aspect, the inguinal region, or the upper and inner part of the thigh. The skin is folded between the thumb and index-finger of the left hand, and with the right hand the needle is thrust through the skin near the base of the fold into the subcutaneous tissues, and the solution slowly injected.

One of the dangers of hypodermic injections is that a vein may be entered and the drug would be carried to the vital centers in a concentrated form. Abscesses occasionally follow an injection, but in a majority of instances are due to carelessness.

The more common drugs given hypodermically are: Aconitin, $\frac{1}{200}$ — $\frac{1}{100}$ grain; apomorphin hydrochlorate, $\frac{1}{20}$ — $\frac{1}{10}$ grain; atropin sulphate, $\frac{1}{200}$ — $\frac{1}{50}$ grain; cocain hydrochlorate, $\frac{1}{10}$ — $\frac{1}{6}$ grain; codein phosphate, $\frac{1}{8}$ — $\frac{1}{2}$ grain; corrosive sublimate, $\frac{1}{100}$ — $\frac{1}{30}$ grain; digitalin, $\frac{1}{100}$ — $\frac{1}{50}$ grain; hyoscyamin (crystalline), $\frac{1}{120}$ — $\frac{1}{50}$ grain; hyoscin hydrobromate, $\frac{1}{200}$ — $\frac{1}{100}$ grain; morphin, $\frac{1}{8}$ — $\frac{1}{4}$ grain; nitroglycerin, $\frac{1}{200}$ — $\frac{1}{50}$ grain; pilocarpin hydrochlorate, $\frac{1}{20}$ — $\frac{1}{8}$ grain; strychnin, $\frac{1}{100}$ — $\frac{1}{20}$ grain.

ANTISEPTICS AND DISINFECTANTS

Bichlorid of Mercury.—This is the most used of the stronger antiseptics. It is employed in surgery to disinfect the surgeon's hands and the site of operation. It is used to render sterile rubber and glass tubing, towels, and dressings. It is employed to irrigate wounds, purulent cavities, the vagina, etc. In dressing infected wounds it is very useful as a wet application.

It is employed in solutions of varying strengths, from 1 : 15,000 to 1 : 500. For use on the surgeon's hands and the site of operation in a 1 : 1000 solution ; for irrigating cavities in a 1 : 10,000 solution ; for disinfecting bedclothing from the beds of patients suffering from the acute contagious fevers a 1 : 500 solution is proper.

Decomposition of the bichlorid solution which often occurs may be prevented by adding to each pint of solution 4 grains of citric acid, or 8 grains of ammonium chlorid, or 8 grains of common salt, or 8 grains of tartaric acid.

Solutions of bichlorid of mercury cause corrosion of metallic substances, and should not be used to disinfect metal instruments or kept in metallic receptacles.

When this antiseptic is used as a moist dressing on wounds or as an irrigant for cavities, vigilance must be kept for the appearance of toxic signs, which may result from absorption of the drug. The first symptoms are salivation, abdominal colic, diarrhea, vomiting, sore gums, and ill-smelling breath.

Mercurial eczema occurs in nurses who are especially susceptible and have their hands immersed much in bichlorid solutions.

Carbolic Acid.—Excepting the bichlorid of mercury this is the most employed of the strong antiseptics. It is used in surgery for sterilizing instruments and for cleansing surfaces.

It is employed in solutions varying from 1 : 100 to 1 : 10. A 1 : 20 solution is sufficiently strong for disinfecting instruments ; for irrigating purposes, a 1 : 100 solution ; for disinfecting bedclothing, a 1 : 10 solution.

Like bichlorid of mercury, carbolic acid when applied externally may be absorbed and produce such toxic signs as headache, vertigo, nausea, dark-colored urine, and purging. Gangrene has followed the local use of weak solutions of carbolic acid.

Two drawbacks to the use of this antiseptic are its benumbing effects on the fingers of the surgeon and the cracking and chapping of the skin where the solution is in contact.

Formalin.—This is a 40 per cent. solution of formaldehyd in water, and is used for disinfecting wounds and instruments and for irrigating purposes. For the former use 2 per cent. solutions and for the latter 0.25 per cent. solutions. It is irritating not only to the wounded areas, but to the eyes and nose of the patient.

Hydrogen Peroxid.—How much germicidal power this drug possesses is an open question. Nevertheless it is particularly useful in cleaning wounds and cavities contaminated with pus and necrotic tissue. When hydrogen peroxid comes in contact with dead organic material it sets oxygen free and destroys the pus or necrotic tissue.

When injected into deep pockets or cavities there

must be free exit for the foaming material, otherwise the tissues are "ballooned up" and injury may result.

Iodoform.—This substance is said to be devoid of power to inhibit bacterial growth, but does overcome the noxious action of the products of decomposition and fermentation. It is used especially in the treatment of ulcers and abscesses of tubercular origin.

This drug is also capable of producing toxic symptoms through absorption. The most common signs are headache, nausea, loss of appetite, skin eruption, and mental exhilaration.

Lead-and-alum Lotion.—This is much used as a moist dressing, both for its astringent and antiseptic action. It is prepared by mixing together equal parts of two solutions, one of which is alum, 6 drams; water, 1 pint; the other is lead acetate, 9 drams, and 30 grains in 1 pint of water.

Boric Acid.—This is an efficient antiseptic of the weak class, and is used extensively in eye, ear, nose, mouth, and bladder antiseptics. It is employed as a saturated solution (1 : 25 or weaker).

Silver Salts.—Silver nitrate and the recent organic silver combinations, as protargol, argonin, argyrol, collargol, nargol, etc., are much used in the treatment of purulent conditions due especially to the gonococcus.

Creolin.—This substance is an efficient non-irritating and non-toxic antiseptic. It is used for irrigating and for vaginal antiseptics. With water it forms a soapy emulsion. Used in 1-4 per cent. solutions.

Lysol.—Same action and uses as Creolin.

Potassium Permanganate.—This antiseptic is used in disinfecting the hands before operations, for irriga-

ting purposes, and as a dressing, especially for foul-smelling wounds and ulcers.

After scrubbing the hands well with soap and water, they are immersed in a saturated solution of potassium permanganate, then decolorized with a saturated solution of oxalic acid, and rinsed in sterile water.

Aristol.—This is a compound of iodine and thymol, and is used as a substitute for iodoform. It is non-irritating, non-toxic, and devoid of odor. Useful as a dusting-powder for ulcers.

Resorcin.—This substance is allied to carbolic acid. It is employed as an application in cellulitis and erysipelas. Also useful in washing out the bladder (3 per cent. solution).

Ichthyol.—This is a very valuable mild and non-irritating antiseptic, used extensively in erysipelas, gonococcal infections, abscesses, and cellulitis. It may be used pure or in watery solutions of 1 : 20 to 1 : 2.

Borax.—This is used for the same purposes as Boric Acid.

Turpentine.—This oil is a very useful antiseptic for the disinfection of ragged, lacerated wounds resulting especially from car, wagon, and machinery accidents.

Soda-Chlorine Solution (Dakin's Fluid).—During the Great War a non-irritating and efficient antiseptic was employed in hospital and surgical work, both as a wet dressing and for the irrigation of wounds.

The method of preparation follows:

Sodium carbonate (sal soda)	6 drams.
Chlorinated lime (fresh)	1 ounce.
Boric acid	2 drams.
Water	20 ounces.

Dissolve the sal soda in the water and to this add the chlorinated

lime and stir thoroughly. Allow to stand for one hour, decant the clear supernatant fluid, and filter through cotton. Add the boric acid to the finished product. Only such quantities of this solution should be prepared as will be required for a few days' use.

Hygienic Laboratory Pine Oil Disinfectant.—A disinfectant with a high carbolic acid coefficient was prepared at the United States Public Health Service Hygienic Laboratory. The mode of preparation was given in Reprint No. 304 and is here appended:

"The best results are obtained when the oil, rosin, and alkali solution are mixed in the following proportions and according to the following directions:

	Metric.	Avoirdupois (by weight).
	Grams.	Ounces.
Pine oil.....	1000	35.3
Rosin.....	400	14.2
25 per cent. NaOH solution.....	200	7.1

"This will make approximately 1500 cubic centimeters or 1.6 quarts of disinfectant.

"The pine oil and rosin are heated together in a covered 'enameled ware' pail until the rosin is all dissolved. The mixture is cooled to 80° C., the sodium hydroxid solution added, and the liquid violently stirred or 'beaten' for at least ten minutes with a rotary 'Dover' egg beater. Sufficient water is added to make mixture to the original weight. The preparation is then cooled quickly by placing the pail in cold water. It is stored in glass or metal containers till used.

"The *finished disinfectant* is a dark reddish-brown liquid, rather thick and oily in appearance, and free

from turbidity or cloudiness. It makes a perfectly white emulsion, much resembling milk when added to water. If the dilution water is at a temperature of less than 30° C. the emulsion will last for weeks. If hot water is used, a layer of oil eventually forms on the surface. The germicidal power of the disinfectant remains practically constant for about two months. After that a noticeable deterioration occurs. Samples four months' old show a phenol coefficient of about 3.5. The pine oil itself is more stable than the emulsified product. It is well to buy only a few months' supply of the oil at a time, and to make up only enough disinfectant for a month's use.

“Uses.—This disinfectant may be used wherever the ordinary coal-tar compounds are used. It has a much more pleasing odor than the coal-tar compounds, and can be used where these products, on account of their odor, are not practical. It will not attack fabrics or metals and is recommended for the disinfection of all articles used in the care of contagious diseases. It has not a displeasing taste, and has been used with success as an antiseptic throat spray and tooth- and mouth-wash.

“It can be used in any dilution up to 1 : 500. The most economic strength depends wholly on the length of time it is allowed to act.”

DISINFECTION

We will consider the disinfection of the sick-room, bedclothing, wearing apparel, and the excreta of the patient.

The room of a person ill with a contagious disease should always be disinfected after the patient becomes well. For this purpose we possess several good disin-

fectants, as sulfur, formaldehyd, and bichlorid of mercury.

Sulfur Fumigation.—The room is closed as tightly as possible; the crevices of the windows and doors are filled by packing them with old newspapers. The bedclothing and the wearing apparel used by the patient and nurse are hung about the room loosely. Powdered sulfur is placed in a metal vessel, which in turn is placed in a broad shallow tin or zinc basin to prevent fire. The sulfur is lighted by placing on it a small shovelful of glowing coals or by mixing with the sulfur a small quantity of alcohol and lighting it with a match. Then leave the room and close the door tightly. The room is to remain closed for twenty-four hours, when it is well ventilated by opening all of the windows. Five pounds of sulfur are sufficient for every 1000 cubic feet of space to be disinfected.

Formaldehyd Fumigation.—This method not only furnishes the best results, but it is absolute. The gas penetrates deeply, does not destroy the most delicate fabrics, will not bleach, and is easily manipulated.

The room, as for sulfur fumigation, must be absolutely tight. The clothing should be hung loosely about the room; all drawers of the bureaus and chiffoniers opened, and books standing on their edges with the leaves separated. The carpets and clothing should be sprinkled with water.

Formaldehyd gas may be set free in several ways: By heating wood alcohol; by heating solid formaldehyd; by heating formalin; by treating formalin with chemicals. This last means is very simple, handy, and efficient. The formalin may be treated with sulphuric

acid and unslaked lime or by potassium permanganate. To 6 ounces of formalin add 2 ounces of sulphuric acid and 1 pound of unslaked lime, or add to 1 pint of formalin $6\frac{1}{2}$ ounces of potassium permanganate. Either of these two methods will set sufficient gas free for 1000 cubic feet of space and requires no special apparatus.

The room is closed for twenty-four hours and then thoroughly ventilated.

Bichlorid of Mercury Method.—By this method the floor, walls, furniture, and wood work are thoroughly scrubbed with soap and hot water and then wiped with a cloth moistened with a 1 : 500 solution of bichlorid of mercury. The room is then ventilated well for a day or more.

Bedclothing.—Before the clothing from the beds used by persons affected by a contagious or infectious disease are sent to the laundry they should be soaked for twelve hours in a carbolic acid solution (1 : 10) or a bichlorid of mercury solution (1 : 500). After this they may be boiled, washed, and hung up in the open air for a day or more.

EXCRETA DISINFECTION

Sputum.—The sputum of patients ill with pulmonary tuberculosis, pneumonia, and influenza is highly infectious, and should be collected and destroyed. Cups may be used for collecting the sputum. Some advise placing a strong antiseptic solution in the cup, which does not seem safe, but if cups are to be used fill them partially with water and add the antiseptic before the cups are emptied. A better way to dispose

of the sputum is to have the patient expectorate into a piece of clean soft cloth and burn it immediately.

Urine and Fæces.—In cases of typhoid fever these excrements are swarming with germs and should be rendered innocuous.

The disinfectant should not only be added to the excretions, but should be placed in the urinal or bedpan before they are used. Among the best disinfectants for this purpose are carbolic acid (1 : 10), bichlorid of mercury (1 : 500), chlorinated lime (full strength), copper sulphate or blue vitriol (1 : 4), iron sulphate or copperas (1 : 4), zinc sulphate (1 : 10). For obvious reasons the chlorinated lime should not be placed in the vessel before the patient uses it, and the bichlorid solution should not be placed in metallic dishes. The mixture of excrement with the disinfectant should not be emptied at once, but allowed to stand several hours.

SWIMMING POOL DISINFECTION

The very common use of swimming pools; the not infrequent dissemination of disease by this means; the employment of a nurse in the charge of swimming pools, make it very necessary that the nurse should possess knowledge of swimming pool disinfection.

The spread of diseases of an infectious nature by means of the pool is not at all uncommon, and, in fact, it may become a menace. It is not only necessary that the water placed in the pool should be clear and pure, but it should be kept pure. The class of people using public pools cannot be easily controlled as a rule, and even the most unsuspected individual may contaminate the water.

Venereal diseases, vulvovaginitis, conjunctivitis,

influenza, typhoid fever, intestinal, and ear diseases have all been spread by the pool.

It is necessary that the pool be of sufficient size to accommodate the number of people who use it, otherwise the water must be changed very frequently.

Copper sulphate or blue vitriol has been used for the disinfection of swimming pools. One ounce of the chemical should be used for every 15,000 gallons of water to be treated. The copper sulphate is first dissolved in 5 gallons of water and half of the solution is thrown into each end of the pool. It should then be thoroughly scattered by means of an oar or pole.

To find the amount of water in a pool, multiply the length of the pool (in inches) by the breadth of the pool (in inches). This product should be multiplied by the average depth of the pool (in inches). The result is then to be divided by 231 and the number of gallons of water in the pool is thus obtained.

TOPICAL MEDICATION

COUNTER-IRRITATION

When certain drugs are applied to the cutaneous surface a reddening of the skin is produced by stimulating the peripheral circulation and attracting blood from distant parts. This is known as counter-irritation.

In inflammation the first phenomena to occur are increase of blood to the part and transudation of serum and cells from the blood-vessels. If an increased amount of blood can be attracted to other parts of the body, then to a great extent the stasis of blood and transudation in the inflammatory areas may be lessened. It is for this reason that counter-irritation is employed.

Agents.—Among the more common counter-irritants are: Ammonia, capsicum, iodine, mustard, turpentine oil (rubefacients); acetic acid, cantharides, ammonia, kerosene, and croton oil (vesicants).

Indications.—To relieve pain; to aid in the absorption of fluid accumulations; to overcome inflammatory processes. Counter-irritation is useful in bronchitis, pleurisy, pneumonia, vomiting, convulsions, abdominal colic, diarrhea, rheumatism, neuralgias, meningitis, coma, apoplexy, effusions of the pleura, pericardium, and peritoneum.

Rubefacients produce redness of the skin, and if the action is prolonged blisters result. The vesicants cause blister formation.

Mustard.—This is generally applied as a plaster, made by mixing powdered mustard and flour in a proportion of 1 : 1 to 1 : 8, depending on the patient, the condition of the skin, and the site of application. The mixture of the mustard and flour is moistened with warm vinegar or water and stirred until it becomes of the desired consistence, when the paste is spread on thin cloth and applied to the part. The mustard paste is also prepared by adding the mustard to a regular flaxseed paste.

Mustard-plasters are left on the skin until the surface is reddened or pain results, when the plaster should be removed and a new one applied over another area. Mustard-plasters generally act sufficiently in fifteen to thirty minutes. If the red area resulting from the use of a mustard-plaster is very painful or irritating, it may be dressed with vaselin or bismuth subnitrate.

A most excellent form of mustard counterirritation is the mustard bath. This will be found especially useful in chest disturbances of children and infants. To every 5 gallons of warm (not hot) water add 1 tablespoonful of powdered mustard. The child is immersed in this five minutes, then removed, and the skin gently but rapidly rubbed until it glows. A mustard foot-bath is useful in congestive headaches, colds, and bronchitis.

Mustard may also be applied as a liniment or cerate.

Capsicum.—This is used mostly in combination with other spices, in what is known as the *spice-poultice*. This is prepared by mixing (in powdered form) ginger, cloves, cinnamon, and allspice, of each equal parts, and one-half part of Cayenne pepper or capsicum. These are made into a small pillow or bag of cloth and moistened with warm vinegar when used.

Turpentine Oil.—This is best applied as a mixture of warm lard or cotton-seed oil and turpentine, in the proportion of 6 parts of the former to 1 of the latter.

Ammonia.—A most efficient way of applying ammonia as a counter-irritant is as a liniment, composed of equal parts of ammonia-water, alcohol, and soap liniment.

A drop or two of strong ammonia-water is applied to the skin and kept free from air by placing over it an inverted watch-crystal or small glass vial (to blister).

Cantharides (Spanish Fly) is extensively used as a vesicant.

Blistering is employed to aid in the absorption of pleural, pericardial, articular, and meningeal effusions. Blistering agents act by dilating the peripheral vessels,

which relieves some tension in the area of effusion, and by dilating the lymphatics, which absorb the effused fluid.

Cantharides may be applied as a plaster, cerate, liniment, or collodion. The plaster is either cut in narrow strips and applied so as to intersect and cross each other or it may be cut into small squares and applied. Do not cover a very large area, as poisoning may follow absorption.

It takes from four to twelve hours to raise a blister. When the plaster is removed apply an oily or bismuth dressing. To open a blister, do not puncture the raised epithelia, but enter the point of a curved needle in the skin near the base of the blister and force it up under the center of the blister, so as to leave a complete epithelial covering on the area.

Kerosene Oil.—This is applied with equal parts of olive or cotton-seed oils.

Selection of Site.—For analgesic effect apply the medicament over the seat of pain, unless this is referred when the application is made at the origin of the pain: in the knee pain of hip-joint disease the counter-irritation should be made over the hip and not the knee. In neuralgias and neuritis place a narrow strip of plaster along the course of the nerve. To overcome inflammatory processes the application should be made at some distance from the seat of trouble. In meningitis, cerebral congestion, apoplexy, and coma apply a vesicant at the nape of the neck and a mustard-plaster to the abdomen and legs. In pleurisy, bronchitis, and asthma apply the counter-irritant to the abdomen and over the seat of pain. To influence fluid accumulations,

as in pleurisy with effusion, the application is made below the nipple and in the axillary line ; in pericarditis with effusion, at the base of the heart ; in peritonitis, over the tender area. For vomiting apply a mustard-plaster over the epigastrium or "pit of the stomach."

Contraindications to the employment of vesicants are lack of vitality, such as results from long-continued fevers, extremes of age, infancy and old age, and paralytic conditions. Obstinate ulcers may result.

POULTICES

Poultices are used for the purpose of applying moisture with heat to relieve tension and pain and to relax the blood-vessels. They are employed in the first stage of inflammatory processes and should not be used when the inflammatory area is denuded, as the formation of pus is then enhanced and the extension of the process augmented.

In preparing poultices two points are to be borne in mind: The material of which the poultice is to be made is stirred into the hot water and not the hot water stirred into the material ; second, the flannel upon which you smear the mass should be hot. The poultice should at least be an inch thick. Do not allow a poultice to remain on the patient until it is cold, but change early.

Flaxseed Poultice.—Into hot water rapidly stir flaxseed meal, which is gradually poured upon the hot water until it is of the consistence of porridge, then spread thickly on hot woolen cloth, apply, and cover with oiled muslin.

Bread Poultice.—This is used especially for eye

affections and is prepared in two ways: Take a thick slice of dry bread and pour hot water upon it, after a minute or so drain off the excess of water and pour on more of the hot liquid, then break the bread and apply; or, allow the bread to simmer in hot water for ten minutes, then mash it into a pulp and apply.

Charcoal Poultice.—This poultice is employed to free putrid ulcers of their odor. To the flaxseed or bread poultice add powdered charcoal.

STUPES

Probably the most-employed stupe is that made with turpentine.

Turpentine Stupe.—This is used especially in the relief of intestinal distention of typhoid fever, pneumonia, and intestinal disorders. It may be prepared in two ways: A piece of flannel is soaked in very hot water and then wrung nearly dry, when turpentine (20 drops) is sprinkled upon it; or, 30 to 60 drops of turpentine are added to hot water and a piece of flannel is immersed in the solution. The oil which floats on the water will be taken up by the cloth. Wring nearly dry and apply.

Chloroform-and-turpentine Stupe.—If after the turpentine stupe is prepared a few drops of chloroform are sprinkled upon it an excellent stupe results.

Stupes should be frequently changed. Care should be taken that turpentine-poisoning does not result from absorption of the drug. This may be prevented by alternating the turpentine stupe with one of plain hot water.

CUPPING

Cupping is a form of counter-irritation used much more in the past than at present. By it blood is drawn to the surface from the deeper parts. Cupping may be performed with wet or dry cups.

Dry Cupping.—The cups used expressly for this purpose have at their summit an air plug, to which may be attached an exhaust pump. The cup is applied to the skin somewhat firmly and by means of the pump the air is withdrawn from the cup, and, in order to equalize the pressure, this loss of air is replaced by a swelling of the skin and tissues into the cup, due to an accumulation of blood in the parts. The cups are allowed to remain in place until they fall off, when they are applied to another part.

The special apparatus described above is not necessary, common graduated medicine-glasses or wine-glasses will accomplish the work fully as well. The inside of the glass is moistened with alcohol, the excess of alcohol is removed, and a lighted match applied to the inside of the glass. The alcohol will immediately take fire. When the alcohol is consumed the cup is firmly applied to the skin and will soon take hold. Allow the cup to remain in place until it releases itself.

Dry cupping is used in congestion and edema of the lungs and in kidney disease.

Wet Cupping.—This is performed exactly the same as dry cupping, except that the area of skin to be cupped is first scarified and the cup then applied as above. By this means the blood is not only drawn to the surface, but into the cups, thus depleting the

tissues. After completing the work the cupped areas should be dressed as an aseptic wound.

Leeching.—See under *Hirudo* (Part II.).

APPLICATION OF HEAT

Varieties.—Heat is applied in two forms : Dry and moist.

Indications.—To relieve pain ; to overcome spasms ; to stimulate the functions of the skin ; to counteract inflammatory processes ; to equalize circulation ; to preserve the vitality of parts.

To Relieve Pain.—For this purpose nothing is more efficient than the application of heat, unless it be cold (in selected cases). Heat is particularly useful in the pain of pleurisy (hot-water bag or poultice), of sprains (prolonged immersion in hot water), of eye diseases (fomentations), of ear troubles (douching and prolonged irrigation), of dysmenorrhea (sitz-bath).

To overcome spasms of muscles in cases of fracture, sprains, lumbago, wry neck, croup, spasmodic dysmenorrhea, convulsions (infantile, uremic, and puerperal), chordee, and cramps of the legs.

To stimulate the functions of the skin (sweating) in nephritis, uremia, and eclampsia.

To counteract inflammatory processes in rheumatism and, in fact, all superficial inflammations.

To equalize the circulation in shock, collapse, and chills.

To preserve the vitality of tissues in injuries of all kinds when life of the part is in danger.

FORMS OF APPLICATION

Poultices.—See under Topical Medication.

Hot-water Bag.—This is one of the most-employed and handiest forms of applying heat. The bag should not be so full that it is weighty and cumbersome, especially when used on the abdomen or chest. When hot-water bags are used on unconscious and comatose persons care should be taken that burns do not result, as the skin of these patients burn easily because of its lowered vitality and on account of the patient's inability to realize the amount of heat applied. It is always well to have a piece of woolen cloth between the bag and the skin.

Good substitutes for hot-water bags are found in hot-water bottles, which are large glass bottles (fully tested) filled with hot water, and hot bricks or hot flat-irons.

Hot fomentations are simply woolen cloths wrung out in hot water.

Hot-water baths are useful in infantile convulsions, nephritis, and uremia. The water should be about 104° F. and the room should be warm.

Hot packs are similar to the cold packs, except that hot water is employed instead of cold water. The full hot pack is especially useful in uremia and eclampsia. A woolen blanket is immersed in hot water and then run through a clothes-wringer until nearly dry, when it is wrapped about the patient.

Sitz-bath.—This consists of an immersion of the hips and buttocks in hot water and steam vapor. It is useful in dysmenorrhea, suppressed menstruation, and pelvic disorders.

Hot-air Baths.—The best form of hot-air bath for

the patient who can walk about is the *Turkish bath*, which consists of a series of rooms, each successive room having a higher temperature, which greatly increases the output of sweat. The final step is a rubbing and shampooing of the whole body, followed by a cold-water plunge or shower. After completion of the bath a rest is necessary before going into the outer air. For bed patients who need hot-air applications the *bed-bath* is employed, which consists of covering the patient (excepting the head) with blankets and introducing under the cover hot air conducted by a tin pipe from a near-by lamp. Another form of hot-air bath is the *cabinet-bath*, which is used for patients not confined to the bed. The patient is seated on a stool and is totally enveloped, excepting the head, with a special cabinet constructed for the purpose or with a large blanket. Heat is produced by a lamp placed under the chair of the patient or, better, outside of the apparatus and conducted within by means of a pipe. The *baking machine* is the last form of hot-air bathing to be considered. It is especially useful in the treatment of chronic joint affections. The limb is suspended in the metal compartment of the apparatus, care being taken that the limb does not touch the machine, as a burn will be produced. The air in the machine is raised to a temperature of 200° to 300° F. by means of a lamp placed beneath the machine. The treatment should continue about one hour.

In all forms of hot-air bathing if sweating does not begin it may be started by giving the patient a drink of cold water.

Russian Bath.—This consists of applying moist heat to the body in the form of heated vapors.

RECTAL ALIMENTATION AND MEDICATION

Medicaments are administered by the rectum in two forms : Enemata and suppositories.

The *indications* for the use of enemata are : To provide nourishment, to empty the lower part of the bowel, to administer drugs for general action, for local action, and to supply the body with fluid.

To Provide Nourishment.—We use for this purpose what are known as *nutritive enemata*. They are composed of concentrated, digested, and easily assimilable material. Food is given by rectum only when it is impossible to give it by mouth, as in cases of excessive and persistent vomiting, in unconscious, comatose, delirious, and refractory patients, when there is grave disease of the stomach, as ulcer and cancer, in pharyngeal paralysis, etc.

It has been repeatedly shown that proteid in solution, egg-albumin, saline material, and water are capable of being absorbed in the lower colon or rectum.

A very good *nutritive enema* is prepared by mixing peptonized milk, 4 ounces ; liquid beef preparation, $\frac{1}{2}$ ounce ; white of 1 egg, and about 20 grains of salt. To this a small quantity of whisky may be added.

The rectum should first be emptied with a small enema of plain water about one-half hour before the nutritive enema is given.

To Empty the Bowel.—There are several forms of enemata employed to empty the lower bowel :

Soapsuds Enema.—This is one of the simple enemata, and is prepared by mixing thoroughly $\frac{1}{2}$ ounce of soft soap with 1 pint of warm water. It is also made by

agitating a bar of common soap in warm water until it is quite soapy.

Simple Mixed Enema.—Add to the soapsuds enema $\frac{1}{2}$ ounce of molasses and 1 dram of salt.

Turpentine Enema.—To the soapsuds enema add $\frac{1}{2}$ ounce or less of oil of turpentine. This is very useful in relieving tympanites.

Asafetida Enema.—To 12 ounces of warm water add 4 ounces of asafetida emulsion (prepared by agitating $\frac{1}{2}$ dram of asafetida powder in 4 ounces of water). This is useful in tympanites and infantile colic.

Glycerin Enema.—To 1 ounce of warm water add 1 ounce of glycerin. It is best given with a small hard-rubber syringe.

Oil Enema.—Use 1 pint of warm cotton-seed oil.

Purgative Enema.—This is a strong-acting enema and is employed when the simple enemata fail. It is given high, through a rectal tube. It consists of soapsuds solution, 1 pint; glycerin, 1 ounce; magnesium sulphate, $\frac{1}{2}$ ounce; oil of turpentine, $\frac{1}{2}$ ounce.

Ox-gall Enema.—To the purgative enema add 15 grains of powdered ox-gall.

For General Medication.—If for any reason medicines cannot be administered by mouth, as in persistent vomiting, unconsciousness or deliriousness of the patient, or on account of ill-taste of medicines, they may be given by rectum. Any drug except those of a corrosive character may be administered in this way. Give them in as small bulk as possible to prevent their expulsion.

In diarrhea the *starch-and-laudanum enema* is much employed. Make a thin starch paste in the usual way

(hot method), and to 2 ounces of this paste add the laudanum (5 to 20 drops, depending on the age and condition of the patient). This enema is best given by means of a small hand syringe.

For Local Medication.—In diseases of the rectum and neighboring organs medication is often applied by the rectum. We will consider but one—the *quassia enema*—which is used in treating pin-worms of the rectum. To 1 dram of quassia chips add 8 ounces of cold water, allow to stand two or three hours, strain, and use as a single injection.

To Supply Fluid.—See Enteroclysis.

ANTITOXINS, SERUMS, AND BACTERIAL VACCINES

Space will not be given to the discussion of the formation and production of antitoxins.

Diphtheria Antitoxin.—Since this serum has come into practical use the mortality from diphtheria has greatly decreased; the disease runs a shorter and less severe course in many instances and the complications are less frequent.

Administration.—Antitoxin is to be given as soon as diphtheria is suspected. The initial dose in cases of moderate severity should be at least 3000 units. After giving antitoxin the symptoms soon begin to lessen, the patient feels easier, the pulse is better, the temperature decreases, and the local patches in the mouth and throat look less angry and begin to grow smaller. If improvement does not begin within twelve hours the dose of antitoxin should be repeated. In severe cases the serum should be given at regular intervals.

Antitoxin must be given early in the disease and in

sufficient quantity. The danger is not in overdosing, but in underdosing.

Ill Effects of Antitoxin.—After the administration of antitoxin certain symptoms may arise which are due not to the antitoxin, but probably to the horse serum which contains the antitoxin. These symptoms are, as a rule, trivial, but may cause alarm if their meaning is not understood. The principal after-effects are: Scarlatiniform rash, urticaria, pain, tenderness, and swelling of the joints. These symptoms may occur within a few minutes after giving the antitoxin or may be delayed for several days or weeks.

Immunizing Effect.—In small doses (500 units) the antitoxin will act as a prophylactic against diphtheria in persons exposed to the disease. Nurses attending diphtheria patients and all persons exposed to the disease should receive an immunizing dose of antitoxin.

Site of Injection.—The subcutaneous injection of antitoxin may be given at any suitable site, but probably the best place is between the scapulæ, as the patient cannot witness the manipulations and the protection of this area is good.

Before giving the injection the area of skin should be cleansed as in performing a hypodermoclysis.

Antistreptococcus Serum.—The discovery of this serum is due to the efforts of Marmorek (1895).

This serum is employed in the treatment of disease supposed to be caused by the streptococci. The results of its use vary, but in many instances have been most happy.

It is employed in erysipelas, scarlet fever, puerperal sepsis, pyemia, septicemia, and acute articular rheumatism.

Dosage.—This serum is administered in the same way and manner as diphtheria antitoxin. The initial dose is 10 cc., and may be repeated.

Tetanus Antitoxin.—This serum has been used most successfully to prevent tetanus, but after the disease is established it is doubtful if the antitoxin is of great value.

The antitoxin should be given as a prophylactic to patients suffering from wounds produced by rusty nails, slivers of old wood, blank cartridges, fireworks, and accidents occurring in barns or when filth of the street is incorporated in the wound. It is well known that the tetanus bacilli are found around barns and in the roads where excreta from animals abound.

Dosage.—This serum must be given early and in frequently repeated doses of 30 cc. each.

Antipneumococcus Serum.—The use of this serum is still in its infancy. Good results have been reported after its employment. It is said to be abortive and that it lessens the severity of the disease and causes the fever to fall by lysis instead of crisis.

Dosage.—Of this serum 15 cc. should be given every four to six hours during the height of the disease.

Cholera Antitoxin.—An antitoxin against cholera has been found, but is said to be more of a prophylactic than curative.

Antidysenteric Serum.—This serum has lately passed from the experimental to the practical stage. It is used in dysentery due to Shiga's bacillus. Its usefulness depends on early and sufficient administration.

Dosage.—Of this serum 10 cc. are given two to four times a day during the early stages of the disease.

Antimeningococcic Serum.—An antitoxin to combat cerebrospinal meningitis may now be had. It has been used with considerable success in the treatment of this disease. The fatality has been greatly reduced. The administration of this serum differs from that of other antitoxins. It is necessary that this serum be injected into the spinal canal, which may not be a simple procedure. The initial dose ranges from 10 c.c. for a child to 50 c.c. for an adult.

Anti plague Serum (Yersin's Serum).—This antitoxin is used both for the prevention and cure of bubonic plague. It should be freely given in doses of 50 c.c., preferably intravenously.

Poliomyelitis Serum.—Work is being done toward the perfection of a serum to be used against infantile paralysis. Happy results seem to have followed the experiments so far undertaken.

Other antitoxins are constantly being experimented with and made practical. They are those against *yellow fever, typhoid fever, tuberculosis, syphilis, rabies, cancer, and snake-venom.*

BACTERIAL VACCINES

Vaccine Therapy.—It is well known that many individuals recover from infectious diseases without the use of medicines, and at times without the assistance of a medical attendant. This does not depend on luck or good fortune, but upon the sound physiologic basis of tissue resistance. In other words, the human body possesses the property of overcoming, to a certain degree, pathologic or morbid conditions. This physiologic resistance varies in different individuals; some can only withstand the very light infections,

while others conquer the most intense ravages of bacterial life.

It is possible to aid the individual, by artificial means, to acquire to a greater than normal extent the power to destroy the offending bacteria. It is granted that within the human body, especially in the blood, are certain small white cells, which in time, of necessity, may come to the defense of the tissues and help subdue molesting influences. These small cells are termed phagocytes, which literally means scavengers. Whenever infectious disease invades the human economy, these cells are found to be very greatly increased at the focus of bacterial encroachment, and at once begin to hem in and destroy or disarm the enemy. The result of the battle depends on whether the greater force is on the side of the bacteria or in the ranks of tissue resistance. In the blood-serum are certain substances or qualities which act upon the transgressing bacteria, and so alter the germs that they are very readily taken up and destroyed by our friends the phagocytes. The term applied to these helping hands is opsonins, which means "I prepare your food."

Now, by scientific investigation, it has been found that both the phagocytes and the opsonic property of the blood-serum may be increased by introducing into the person's system certain substances, called vaccines.

A vaccine is a suspended solution of dead bacteria, the base of the solution being normal saline solution. The vaccine is prepared by growing or cultivating the bacteria on a medium, then killing the germ life by means of heat and suspending them in normal saline solution. The vaccine solution is then standardized so that a given amount contains a certain number of

bacteria. The more common vaccines of the present day are those against the infection by the streptococcus, staphylococcus, colon bacillus, gonococcus, pneumococcus, typhoid bacillus, and tubercle bacillus.

The streptococcus vaccine has been found useful in the treatment of scarlet fever, erysipelas, septic endocarditis, puerperal infections, cellulitis, and lymphatic abscesses. The staphylococcus vaccine is particularly useful in boils, carbuncles, pustular acne, sycosis, and forms of eczema. The colon bacillus vaccine, although not so thoroughly developed, may be of value in forms of cystitis, fistula in ano, etc. The gonococcus vaccine has given remarkable results in various gonorrheal infections, especially arthritis, vulvovaginitis, epididymitis, and prostatitis. It is hoped that the acute urethritis may soon retreat before this agent. The pneumococcus vaccine has been employed with some satisfactory results in the treatment of lobar pneumonia. The typhoid vaccine promises much. The results following its use in the British and American armies have been very gratifying. This is especially so in its use as a preventive agent; in some instances immunization has lasted nearly five years. Tuberculin or tubercle vaccine has been proved of value in some but not all forms of tuberculosis. In gland, bone, and some types of pulmonary disease it has been useful. As a diagnostic agent it is invaluable, and will be discussed in later pages.

As stated above, vaccines are prepared from bacterial cultures. The bacteria employed to make the cultures may be derived from the individual to be treated, and the vaccine is known as an *autogenous*

vaccine; whereas, if the bacteria are of outside or common origin, a so-called *stock vaccine* results.

The doses of the various vaccines vary. The initial dose should not be large. The following are the relative amounts to be employed at the beginning: Staphylococcus, 50,000,000 to 500,000,000; streptococcus, 5,000,000 to 50,000,000; gonococcus, 5,000,000 to 100,000,000; pneumococcus, 10,000,000 to 100,000,000; colon bacillus, 5,000,000 to 100,000,000; typhoid bacillus, 5,000,000 to 40,000,000; tuberculin, $\frac{1}{100000}$ to $\frac{1}{10000}$ milligram. The vaccines are administered with the hypodermic syringe. The injection is made under the skin and not into the muscles. After giving the vaccine, certain reactions or phases occur. First appears the negative phase or condition in which the opsonins of the blood are lessened, which is followed in two to forty-eight hours by a positive phase with increased opsonic power of the blood, and improvement of symptoms takes place. The dose is repeated when apparent improvement lessens.

Antirabic Therapy.—Rabies or hydrophobia is another horrible disease which science has all but conquered. The disease is communicated to man by wound inoculation induced usually by the bite of a rabid dog, although other animals may transmit the disease, as horses, cattle, cats, and wolverine animals.

As a routine measure the wound should be carefully cleansed, antisepticated, and cauterized. Nitric acid is the best chemical cautery, but in its absence silver nitrate, carbolic acid, or the actual cautery may be employed.

The rabid or supposed rabid animal inflicting the wound should not be killed, but imprisoned in a safe

place, so that it can do no further injury. The animal usually dies two or three days after the onset of acute symptoms. The reason for not killing the beast is that an absolute diagnosis may be made.

It is to Pasteur that we owe the honor and praise for developing this branch of therapeutics. It was ascertained that the spinal cords of rabbits dying of rabies induced by the injection of rabic virus were very toxic, but if allowed to dry this toxicity became less and less and finally disappeared. It was also learned that by injecting into the suspected person an emulsion made from these cords a state of immunity might be induced. This is the object of the treatment. At first an injection of a very weak emulsion is used, that is, one prepared from a cord that was in the drying process for the longest time. Each successive injection was of an emulsion of greater strength than the preceding. The injections are made daily for twenty-one to twenty-five days or more, depending on the stage when the treatment was begun. The injections should commence soon after the injury is received.

Tuberculin in Diagnosis.—The employment of tuberculin in the diagnosis of tuberculosis must be acknowledged as one of the greatest strides in scientific medicine. There are various tests in existence, each of which has its merits, but the underlying principles of all are the same. The introduction of minute amounts of tuberculin into the system of a healthy person should produce no apparent change. On the other hand, if the injection be into a person afflicted with tuberculosis, a very apparent change or reaction

is usually observed. The reaction may be general or local, or may partake of both. The general reaction consists of a rise in temperature, malaise, nausea, chilliness, and general depression. The local reaction is congestion, heat, swelling, and exudation. The principal tests are four in number, namely, subcutaneous, ophthalmic, percutaneous, and cutaneous. Each of these tests will be separately considered.

Subcutaneous Test.—This form was the original tuberculin test and is not free from danger, and is to be employed only in selected cases. Before using this test the patient should be free from fever several days or only slightly above the normal. The first injection, made by means of a hypodermic syringe, should not exceed $\frac{1}{2}$ milligram of tuberculin (old), but later doses, if necessary, may be greater. Eight to twelve hours after injection the reaction may appear, and consists of a distinct rise of temperature, headache, joint-pains, nausea, malaise, and depression.

Ophthalmic Test.—To Wolff-Eisner belongs the honor of developing this diagnostic means. On the conjunctival surface of the lower eyelid of one eye is placed a drop of tuberculin especially prepared for this test, being careful that it does not flow on the face by depressing the lid until the distribution of the solution is equalized. In six to twelve or even forty-eight hours the reaction appears as a conjunctival congestion, with the sensation of a foreign body in the eye. There may be swelling of the soft tissues and exudation. If there is eye disease of any kind, this test should not be applied.

Percutaneous Test.—This is commonly known as

the Moro test, and consists of rubbing into the skin a small amount of tuberculin ointment prepared for this use. The skin of the abdomen is usually selected, and a circular area about 2 inches in diameter inoculated. After the lapse of ten minutes a gauze dressing is applied. The reaction is revealed by the formation of small papules, which greatly vary in number, depending on the severity of the reaction. They usually appear in twenty-four to forty-eight hours.

The *cutaneous*, or *von Pirquet test*, is the form generally used by the author. Its application is simple and free from danger. The arm or forearm is usually selected as the place of test. The skin should be thoroughly cleansed by means of soap and sterile warm water, without the use of strong antiseptics. Then, in a straight line along the long diameter of the limb, three superficial scarifications are made with a needle as in small-pox vaccination. The spots are to be placed about 2 inches apart. Into the upper and lower scarifications are to be rubbed, by means of the needle-point, a drop of tuberculin solution. The middle area is not to be touched, as it acts as a control. After fifteen or twenty minutes a sterile dressing is applied. The reaction, if positive, appears at the two inoculated areas, whereas the central or control area does not change. The reaction consists of a red or congestive areola, followed by infiltration and vesicle formation if severe.

SMALL-POX VACCINE VIRUS

Edward Jenner in the last decade of the eighteenth century conclusively demonstrated that an individual might be immunized against small-pox by the inocula-

tion with material obtained from bovine animals suffering with cowpox.

At present the virus is prepared by the inoculation of calves. A few years back and even at present in some localities person-to-person inoculation is practised.

Preparation.—Young healthy calves are selected. The area to be used, the abdominal surface, is shaved and scrupulously cleaned. Long parallel scratches or incisions are made over this whole area and the vaccine virus is carefully applied and gently rubbed in. By the fourth day vesicles or water-blisters will have begun to form on the site of inoculation. The calf is then anesthetized and the vesicle coverings and contents are scraped off and placed in sterile receptacles. To this pulp glycerin is added, and the whole is ground and then allowed to stand. From this the finished product is obtained, which is placed on ivory or glass points, in capillary glass tubes or in larger containers. Vaccine virus is placed on the market only by those manufacturers who are licensed by the Federal Government.

Use of Vaccine Virus.—Vaccination is a surgical procedure and should be performed with the same care and attention to cleanliness and asepsis. Most ill results of vaccination are due to the faulty technic rather than faulty virus.

Vaccination may be accomplished by scarification (cross-scratching), incision (straight scratch), or by puncture. The method of incision is being more frequently employed as time goes on. This is performed by carefully drawing the point of a sharp needle along the skin so as to make a scratch about $\frac{1}{2}$ inch long, which should not draw blood.

The site of vaccination is on the outer aspect of the arm in its upper third. Members of the female sex may prefer it elsewhere. The upper and outer part of the thigh, the skin over the head of the fibula, or the lower part of the front of the chest may be used. The site should be thoroughly cleaned as for a surgical operation excepting that no antiseptic should be employed. Chemicals interfere with the "working" of the virus. The virus may be gently rubbed into the scratch, or the drop of virus may first be placed on the skin and the incision made through it. Afterward a light sterile dressing should be applied. The author has found it good practice to paint with iodine a large area around the site of vaccination, using care not to approach the site nearer than $\frac{1}{2}$ inch.

THERAPEUTICS IN CHILDHOOD AND INFANCY

The administration of drugs to children and infants differs much in many instances from that of adult life. Many drugs children should never take, others they stand only in minimum doses, while still others may and should be given in relatively large doses. The condition of the child alters the posology; for instance, a poorly developed and ill-nourished child of eighteen months may only be able to take the dose of a twelve-month normal child. There is here appended a descriptive list of the most common drugs used in the treatment of children.

Aconite has from time immemorial been used in child therapy; although a powerful drug, its action when properly applied and employed is of greatest utility. In acute fevers, during the first or sthenic stage, small or repeated doses of tincture of aconite will often act

very favorably. A quarter minim combined with a saline, as potassium acetate or citrate or solution of ammonium acetate, may be given a child of one year every hour for six or eight doses, or until perspiration is free and the pulse rate lowered. In acute nephritis it is also of great value to encourage sweating and thus relieve the kidneys.

Alcohol, as a stimulant for children and infants, in the author's opinion, should not be employed until other means and drugs have been given a trial. If there is any reason to believe that there is cerebral congestiveness in any degree, the use of alcohol should be interdicted. Stuporous conditions forbid alcohol. In cases with a rapid, irregular, and feeble pulse alcohol may be indicated. The best forms in which to administer it are brandy or whisky, which may be given a child of one year in two-hourly doses of 5 to 20 drops, well diluted.

Ammonia, aromatic spirit of, as a circulatory and general stimulant, may be given well diluted to a child of one year in doses of 2 or 3 minims. It is apt to disturb the gastric functions.

Ammonium chlorid, on account of its taste and irritating action on the stomach, should be administered very carefully. It should be well diluted and, if necessary, sweetened and given after the stomach has had some milk introduced. In bronchitis, with scant expectoration and harsh cough, it is often of value. Dose, $\frac{1}{4}$ gr. several times daily to a child of one year. In catarrhal jaundice the author has found it of value in the same dosage.

Antimony and potassium tartrate as an expectorant

in the early stages of laryngitis, croup, and bronchitis is very useful. It should be given in small repeated dosage: $\frac{1}{100}$ gr. every two hours to a child of one year. This drug is irritating to the gastro-intestinal tract, and should be preceded and followed by water, milk, or gruel.

Antipyrin has been advocated as a fever-dispelling agent for children, but the author believes other means should be relied on to reduce high temperatures in infants and children. Its use in whooping-cough certainly demands attention and has been found very valuable in the writer's hands. To a child of one year $\frac{1}{2}$ to $\frac{3}{4}$ gr. may be given every three hours.

Arsenic is a drug which children stand in relatively larger doses than adults. It also is a gastro-intestinal irritant, and should be given only when the stomach contains food. Its dosage should be gradually increased to get the best results. It is of value in anemia, chorea, adenitis, recurrent mucous membrane diseases, as pharyngitis, bronchitis, gastritis, and enteritis. As a general tonic or alterative in malnutrition, functional nerve disease, and convalescence it is useful. For a child of three years the following doses are appropriate at the beginning: Arsenous acid, $\frac{1}{800}$ to $\frac{1}{100}$ gr.; Fowler's solution or liquor potassii arsenitis and all the arsenical solutions of 1 per cent. strength, 1 to 2 minims. During the administration of arsenical preparations certain signs of toxic effect or poisoning may occur if the increase of dosage is pushed too rapidly. These are abdominal griping, loose bowel movements, swelling beneath the lower eyelids.

Asafetida is a very valuable agent to dispel flatus from the bowel. It is used as a rectal injection slowly introduced. To 4 ounces of warm water add 2 gr. of powdered asafetida and agitate well into an emulsion or mixture.

Aspidium, or *male fern*, is employed in the treatment of worms; 10 gr. of the oleoresin may be given to a child of four years. It should be administered on a fasting stomach after thoroughly evacuating the bowels with castor oil. A second dose of castor oil should be given four hours after the aspidium.

Belladonna and its derivatives may be taken by children in relatively large doses. Belladonna and atropin find their most frequent employment in whooping-cough, nocturnal incontinence of urine, and coryza; $\frac{1}{800}$ gr. of atropin or 2 or 3 minims of tincture of belladonna are average doses for a child of two years.

Bismuth preparations, especially the subnitrate, are useful in the treatment of diarrheal and acute enteric disorders. The subnitrate should be given in fair size dosage (10 to 20 gr. every few hours) to a child over one year of age.

Bromids are valuable as nerve sedatives, and should be given in solution form and very well diluted. For a child two years of age 3 to 5 gr. may be given at three-hour intervals. The bromids of ammonium, potassium, sodium, and strontium are most frequently employed.

Calomel is a valuable cathartic in the initial treatment of acute conditions, and may be given at half-hourly intervals in $\frac{1}{20}$ gr. doses until 1 gr. is adminis-

tered to a child of two years. It should be followed by a saline, as magnesium sulphate, Rochelle salts, or Seidlitz powder mixture.

Cascara sagrada is a useful bowel tonic and laxative for children. Its very bitter taste precludes the use of its simple preparations. The aromatic fluidextract may be given to a child of one year in 10- to 20-minim doses.

Castor oil is the drug supreme in child therapy. There is hardly any disease whose course is not benefited by a preliminary dose of castor oil. A child of one year will bear a teaspoonful dose. Even if the oil be vomited, it should be repeated, for each time a small amount will be retained, and often after several attempts it is held by the patient.

Chloral hydrate is a drug which the writer uses with great caution even for adults. It is thought that children tolerate this drug very well, and it is advised as a nerve sedative in convulsions and chorea in doses of $\frac{1}{2}$ to 2 gr. to a child of one year. Caution should be used.

Codein is probably the safest opiate we possess, and is useful in pains, colic, and irritative coughs; $\frac{1}{20}$ gr. is an average dose for a child of one year.

Codliver oil is foremost among the tonics and reconstitutives in childhood. It should not be given on an empty stomach, but always after meals. In very young infants the pure oil may be employed, but in older children a flavored preparation or an emulsion should be used; 10 drops, for an infant of six months, to 1 teaspoonful, for a child six years.

Creosote is useful in respiratory diseases, as bron-

chitis and whooping-cough. It is a drug difficult to administer because of its taste and odor. It may be given in doses equal to $\frac{1}{4}$ minim for every year of the child's age. Creosote carbonate may be used in doses of $\frac{1}{2}$ minim for every year of the child's age.

Digitalis, although a valuable drug, is not always of value in child therapy. It easily deranges the stomach, causing vomiting and other disorders. As its absorption is slow and it accumulates in the system, its use should often be interrupted. In diseases without very high fever, and in which the pulse is rapid, feeble, and irregular, this drug may be employed as a cardiac stimulant. The tincture may be given to a child of two years in 1-drop doses every four or six hours. The infusion may be used when the urinary function is depressed in doses of 15 to 30 drops to older children. These preparations should not be given unless previously a drink of water, milk, or a meal has been taken.

Dover's powder, a preparation of opium and ipecac, has a legitimate use in child therapy, but should not be abused. In those conditions accompanied by a severe cough, pain, griping, and diarrhea it may be employed. Its action must be watched and the drug withdrawn on the appearance of drowsiness or systemic depression. Average dosage to a child of one year, $\frac{1}{4}$ to $\frac{1}{2}$ gr.; two years, $\frac{1}{2}$ to 1 gr.; three years, 1 to 2 gr.

Hexamethylenamin, also sold under trade names of urotropin, formin, uriton, and hexamin. This is a very valuable drug, and has been found to be excreted in the urine, bile, feces, middle-ear fluid, arthritic fluid,

and cerebrospinal fluid, and is useful in the treatment of cystitis, arthritis, otitis media, cerebrospinal meningitis, and anterior poliomyelitis. The dosage is about 1 gr. for each year of the child's age.

Hyoscyamus may be employed in most instances when belladonna is indicated ; it is also useful to relieve pain when opium cannot be used. The tincture may be given a child of one year in 5-minim doses.

Ipecac is much employed in child therapy in congestive conditions of the upper respiratory tract, as laryngitis, false croup, tracheitis, and bronchitis. To meet these indications it may be given as the powder in $\frac{1}{2}$ gr. ; syrup, in 5-minim, and the wine in 3- to 5-minim doses to a child of one year. As an emetic to young children in 5-gr. doses of the powder, repeated, or a half-teaspoonful or more of the syrup.

Iron is used in various forms and for various purposes. Basham's mixture, or liquor ferri et ammonii acetatis, is of value as a tonic and diuretic in nephritis. Dose, 15 to 30 drops to a child of three years. Syrup of iodid of iron in the hands of the writer has been an extremely valuable iron preparation. In anemia, chronic affections, as tonsillar hypertrophy, adenitis, chronic respiratory troubles of a nasal, pharyngeal, or bronchial nature, and in poor nutrition. Dose, 5 drops to a child of two years. Tincture of iron chlorid is also of great value. This, being of an acid nature, should be given in a well-diluted form after meals, and preferably by means of a glass tube to protect the child's teeth from corrosion. Dose, 5 drops well diluted to a child of two years.

Mercury, as in adults, is useful in attacking the syph-

ilitic diseases. Mercury with chalk is a very good preparation, and may be given a child of two years in doses of $\frac{1}{2}$ to 2 gr. As a preliminary cathartic $\frac{1}{10}$ gr. may be given every half-hour for ten doses, to be followed by oil or a saline. (See also under Calomel.)

Niter, Sweet Spirits of.—This is much used as a diaphoretic, diuretic, and antispasmodic in the beginning of the acute fevers of childhood, in nephritis, and in bronchitis with severe cough. Where used as a diaphoretic the child should be warmly covered and given hot drinks, but if used as a diuretic the covering should be light and cool draughts taken. Dose, 3 to 5 minims for a child of one year.

Nux vomica and its alkaloid, strychnin, are of value as tonics and stimulants. In acute diseases, when the pulse becomes rapid, feeble, and irregular, strychnin is of value. Dosage is to a child of six months, $\frac{1}{500}$ gr.; one year, $\frac{1}{250}$ gr.; eighteen months, $\frac{1}{200}$ gr.; two years, $\frac{1}{150}$ gr.; three years, $\frac{1}{100}$ gr. The tincture of *nux vomica* is useful as a general systemic tonic in doses of 1 or 2 minims to a child of two years.

Potassium acetate and *citrate* are both used as saline diuretics and refrigerants in nephritis and the acute fevers. They should be given well diluted. Dose for a child of one year is 1 to 2 gr.

Quassia is used as a vermifuge for thread-worms. A preliminary cathartic, as castor oil, should first be given to drive the worms to the lower rectum, then an enema of infusion of quassia given. This infusion is made by pouring a pint of boiling water over a table-

spoonful of quassia chips, allowing same to brew for one-half hour, and then strain.

Quinin salts, preferably the bisulphate, are not much used for children except as systemic tonics and in whooping-cough, and, of course, in malaria. As a rule young children take quinin salts very readily, but for older children the taste must be covered by syrups. The dose averages about 1 gr. for each year of the child's age.

Santonin is used in the dispelling of the round-worm. The procedure is similar to that of the tapeworm under aspidium, except that santonin is substituted. Dose for a child of four years is 1 to 2 gr.

Senna is used as a laxative in the form of the syrup and infusion, the former in $\frac{1}{2}$ -dram doses, and the latter 1 tablespoonful for children of three years. The infusion may be prepared by adding to 1 ounce of senna leaves a pint of boiling water and allowing to infuse for one-half hour, then strain and flavor if desirable.

Strophanthus.—The tincture of strophanthus is a very valuable cardiac stimulant in acute diseases of childhood. It is to be much preferred to digitalis in pneumonia, collapse of infantile disorders, etc. Dosage, six months, $\frac{1}{2}$ minim; twelve months, 1 minim; eighteen months, 1 to 2 minims; two years, 2 minims.

DIET LISTS

The tabulation of a diet for every patient suffering from the same disease is impossible, because of the individual differences in persons and the divers courses of the same disease. The following tables are not

meant for routine use, but must at times be modified to suit the conditions at hand.

FEVERS

Although there is a diversity of opinion as to the diet in the acute fevers, the author feels that, as it is a well-established fact that the digestive juices are decreased and the digestive power and function of the stomach and intestines are lessened, that the diet should be of a light nature yet sufficiently nourishing. Milk should really form the basis of diet. The following has been found satisfactory: Milk mixture, peptonized milk, buttermilk, albuminized milk, malted milk (prepared with cow's milk), clam stew and oyster stew (with removal of the clams and oysters), gelatin, ice cream, and coffee. The milk mixture referred to in this list consists of milk, 6 ounces; milk sugar, 1 teaspoonful; beaten white of 1 egg; water and lime-water to make 8 ounces.

Cereal gruels made from farina or cream of wheat, with a milk basis, are valuable. As convalescence approaches we may gradually add such articles of diet as zwieback, toast with milk, egg and milk mixture, junket, broths thickened with dice of toast, or with browned flour. In later convalescence additional diet may be given, as creamed codfish on toast, soft boiled or poached eggs, oysters, boiled rice, tapioca, cereals, baked potato, egg custard, white meat of fowl, broiled lamb or beef (cautiously).

INFANTILE DIARRHEA

During the acute stage the stomach and bowels should be kept in a quiet state with a very scant diet.

Milk seems to act as a poison in these cases during the first forty-eight or seventy-two hours, and should be eliminated from the diet. Simply small quantities of boiled water, rice water, or barley water should be given during the first twenty-four hours; then gradually and cautiously add albumin water, one of the infant foods prepared without the addition of milk. Great care must be employed in returning milk to the diet. Cereal gruels are often well borne later.

ADULT DIARRHEA

In the diarrhea of older persons the diet, although it must be modified, does not necessitate so much curtailing as in the infant and small child. The important point is that the diet be non-irritating. Boiled milk served hot is very useful, cereal gruels, toast and milk, albumin water, albuminized milk, eggs in soft forms, gelatin, ice cream (in some cases), and koumiss.

DIABETES MELLITUS

This disease must be combatted to a very great extent by a regulation of the diet. Although both extremes have been advocated, none or too much carbohydrate food, it is found expedient to greatly reduce the food of this nature. The articles of diet which *may be taken* in a moderate case are meats of all kinds except liver, including smoked meats, as ham and bacon, fish of all varieties, oysters, clams, crabs, lobster, and mussels. Clear soups and broths, gelatins, eggs, butter, cheese, milk (not to excess), and cream. Green vegetables, as spinach, sprouts, pickles, lettuce, celery, cucumber, tomato, asparagus, mushrooms, and the various nuts. Fruits, as oranges, currants, and

berries (in small quantities). Unsweetened tea and coffee. All carbohydrates need not be omitted from the diet of the less severe cases. Oatmeal, toast, and potato in small quantities at times do no harm and may prove beneficial. The following articles of diet should be *forbidden* in diabetes. All foods prepared from flour, starch, or cereals, bread, potatoes, sugar, sweet potatoes, peas, corn, beets, beans, parsnips, carrots, onions, rice, tapioca, puddings, pies, cakes, and sweet fruits.

CONSTIPATION

In preparing a diet list for a person suffering from chronic constipation there are three requisites. First, to eliminate such foods as are known to actively produce constipation; second, to include such articles as tend to overcome the condition; third, to omit foods which are extremely difficult to digest and which are likely to disturb the stomach. Foods which may be partaken of are to some extent here enumerated. Clear soups, fish, beef, lamb, mutton, fowl, game, bacon, ham (small quantity). All breads one day old, especially graham, entire wheat, rye, and bran breads. Oatmeal, coarse cereals with plenty of cream and butter. Nearly all vegetables and fruits. Milk only in small portions. Mineral waters and koumiss. The following should be used only in small helpings. Veal, pork, and new breads not at all. Eggs, milk, cheese, potatoes, beans, rice, tapioca, thick soups, pastry, and nuts.

INDIGESTION AND DYSPEPSIA

The diet in dyspepsia must be individually selected for various persons. The lists herewith given may act

as guides. Articles of food which are more easily digested are: Soups, clear from fat and grease; fish of all kinds excepting those rich in fats, as salmon, sardines, and mackerel; beef, lamb, and mutton, which are baked, roasted, broiled, or stewed, but not fried; fowl of various kinds; broiled but not fried ham or bacon in small portions; eggs in all forms; such vegetables as asparagus, peas, celery, and cresses; cereals well cooked and in small quantities; bread, at least one day old, and zwieback; butter and cream in moderation; koumiss; junket and peptonized milk. The following foods are difficult of digestion, and should be omitted during the height of the disease and only cautiously added to the diet. Pork, veal, sausage, and fried meats; thick soups; game; lobsters, crabs, and shrimps; vegetables, as corn, dried beans and peas, cabbage, cauliflower, sweet potato, beets, radishes, cucumbers, and turnips; new bread and pastries and fresh or frosted cakes; unripe fruits, nuts, and cheese; coffee, tea, and chocolate; all alcoholic beverages.

KIDNEY DISEASE

In the very acute forms of nephritis the diet must necessarily be light and scant. Milk and water should temporarily form the bulk of the diet. Gradually and cautiously cereal gruels may be added. The amount of salt used to flavor these should be very scant or none at all used. Meat broths should not be given. In the chronic forms of nephritis the diet may be, to a certain extent, quite liberal. Milk soups and gruels; vegetable purées are allowable. Also fish of various kinds; beef, lamb, and mutton once a day; fowl; oys-

ters and clams. Eggs not to excess. Milk in all forms. Such vegetables as celery, spinach, cooked onions, green beans and peas, and cauliflower. Cereals, as rice, farina, tapioca, arrowroot, and sago. Breads a day old. Fruits, as grapes, apples, oranges, and pears. The following articles should not be allowed: Veal, pork, and heavy game; sweets, pastries, and cake; highly seasoned foods; pickles, condiments, and cheese; heavy vegetables, as dried beans or peas; alcoholic beverages.

POSTPARTUM DIET

First Day.—Milk, cereal gruels, oyster or clam soup.

Second Day.—As on first day, with addition of toast, crackers, eggs in soft forms.

Third Day to End of First Week.—There may be added light pudding, as tapioca, boiled rice, and sago; baked potato; gelatin and jellies; and later fish; white meat of fowl; broiled chops, roast beef, light vegetables, and fruits.

PASTEURIZED MILK

Milk has been the cause of great epidemics and spread of diseases. The more common ailments which have been disseminated by milk are typhoid fever, diphtheria, scarlet fever, septic sore throat, tuberculosis, and diarrheal conditions.

It may be safely said that raw milk should never be used, but should always be first rendered safe, preferably by pasteurization. Even the best certified dairy milk, far above suspicion, has been the cause of great outbreaks of disease.

Pasteurized milk differs from sterilized milk. The latter is prepared by bringing the milk to the boiling-point, 212° F., which kills all life. The former is prepared by heating the milk to 148° F. for a certain time, preferably a half-hour. This is sufficient to kill the harmful bacteria. The boiling of milk alters the odor, taste, and digestibility. Pasteurization has no appreciable effect in these respects.

When milk is pasteurized in the bottle it is necessary that the milk itself and not only the surrounding water should reach the required degree of heat, and maintained for at least thirty minutes. It should then be placed in a cooler or refrigerator and care taken that no chance for after-infection is given.

All that is needed for the home pasteurization of milk for general use is a double boiler and a thermometer. When pasteurization of milk for infant feeding is undertaken a Strauss apparatus should be employed. This consists of a covered pot and a tray of bottles sufficient for a day's food.

THE REST TREATMENT

The rest cure, or Weir Mitchell treatment, is employed to very great extent in institutional work; and in the opinion of the writer should be used much more frequently in the home treatment of those individuals for whom it is indicated.

The general principles of treatment are the provision of bodily and mental rest, and yet prevent the general tissues and functions of the body from the depression which they usually undergo in bed patients.

The former is attained by placing the patient in bed, if possible away from all friends and familiar faces, and by you (the nurse) being congenial, pleasant, and interesting, yet firm, persuasive, and a possessor of good common sense. The latter requirements are met by means of forced feeding, baths, massage, and the use of electricity. The rest treatment is applicable to those persons suffering from exhaustion due to a long nervous strain: the society leader, the overworked mother, the superardent scholar, the strenuous business man, the overactive politician, and others who mentally do more than they are constructed to do. The melancholic person, the depressed neurotic, and the individual suffering from some form of hysteria often respond well to this type of treatment.

The *room* chosen for the patient should be of fair size, light, cozy, and cheerful. The bed should have easy lying springs and a pliable mattress. The room should be so provided that ventilation may be complete. Rest in bed for three to five or six weeks is imperative. The patient during the first part of the treatment should see no friends nor receive any letters. During the first week in some instances it may be necessary that the patient refrain from all conversation, from sitting up in bed, and from exertion of any kind.

The *diet* in the general run of cases must not only be sufficient to prevent bodily wasting, but must be such that a gain of weight be oncoming. Many patients put on considerable weight while under rest treatment. The diet at first should consist largely of milk in various forms. The writer thinks it well not

to give whole milk, but to partially dilute it with plain water, lime-water, or Vichy. This may be given every two or three hours from 7 A. M. to 9 P. M. The last feeding should be hot milk, as this encourages a more restful night. Gradually other articles of diet may be added. Meat broths, koumiss, buttermilk, ice cream, gelatins, malted milk, cocoa or chocolate, toast, zwieback, rusks, boiled rice, tapioca, eggs in soft forms, and later, substantial meals of soups, meat, easily digested vegetables, and dessert. Unless especially ordered by the attending physician, alcoholic beverages of all kinds, tea, and coffee should not be allowed.

Baths are a very important part of the treatment. They keep the skin active, and thus rid the body of waste products. They also tone up the general system. During the early stage of the treatment the morning and evening warm sponge only are allowable, but later the cold bath, as a needle, douche, or shower, may be given to tone the muscles and circulatory system. The daily warm sponge or tub bath at night is important to bring about a restful sleep.

Massage is very necessary to keep up the nourishment of the tissues, especially the muscles. As is well known, an inactive muscle wastes and an immobile joint becomes stiffened. Massage and passive motions act as substitutes for the active exercise of the normal person. Massage should be performed in mid-morning, and should be of a general character, including all the principal superficial muscles. See the article on Massage.

Electricity is employed for the purpose of bringing about muscular contractions, and thus keep up the

tone and nourishment of the muscles. This, I think, is best given in mid-afternoon, and should preferably consist of application of the interrupted galvanic current, or, for want of apparatus, the faradic current might be substituted. One pole should be placed at some neutral point, as the middle of the back or chest, and with the other pole active contractions of the larger and important muscles should be elicited. In applying electricity in this treatment, no pain at all should be caused.

For an hour toward the end of the morning and afternoon the patient, if possible, should nap. As a means of recreation a pleasant easy conversation may be indulged in, or the nurse might read aloud some light literature.

A general routine after the first week or so is such as that given below, which the author compiled several years ago:

8 A. M.—Breakfast of cereal, cocoa, roll or toast, small chop, or egg.

9 : 30 A. M.—Cool sponge or cold bath, followed by alcohol rub. Glass of milk.

10 : 30 A. M.—Massage, ten to twenty minutes.

11 A. M.—Nap.

1 P. M.—Dinner of clear soup or bisque, meat, baked potato, light vegetable, dessert of farinaceous food, cocoa.

1 : 30 P. M.—Nap.

3 P. M.—Glass of milk.

3 : 30 P. M.—Electricity for ten to twenty minutes.

4 : 30 P. M.—Conversation or reading by nurse.

6 P. M.—Supper of egg in soft form, milk-toast, sauce, and cocoa.

9 P. M.—Warm sponge or bath and cup of hot milk.

MASSAGE

The term massage is derived from a Greek word meaning "to knead." Massage is by no means a new form of therapeutic application, but has been handed to us from ancient days. From the time of the gladiator and the Marathon runner to the present pugilist and foot-ball player, massage has been employed in one or more forms, although crude.

A male person performing massage is known as a masseur, whereas the masseuse is the female person who applies this form of treatment.

There are five fundamental types of massage—stroking (effleurage), kneading (petrissage), rubbing (friction), tapping or percussion (tapotement), and oscillation (vibration). Each of these types of massage have a special and individual effect and indication.

Stroking is used for the purpose of stimulating, correcting, or improving the superficial venous and lymphatic circulations and to aid in skin nourishment; and, as a rule, in all massage treatments is the first form to be employed. Stroking consists of slow, firm, winding, or circular-like pressure movements. The limb is firmly grasped, so that the ball of the thumb is pressed against the patient's limb, and then the operator's hand is slowly yet firmly moved upward in a cork-screw like manner. Stroking should always be directed from the distal to the proximal extremity of the limb.

Kneading is employed to affect the deeper tissues, especially the muscles, and is used to influence the deeper circulation, to aid in the development of the muscular tissue, to hasten absorption of waste products and exudates, and to overcome muscular spasm. In kneading, masses or individual muscles are grasped, and then, with a pinching and rolling action, are manipulated. When kneading muscles care should be exercised that the skin is not pinched or manipulated, but it should form part of the operator's grasp and made to glide over the underlying muscles.

Rubbing is useful when the absorption of old or recent exudates of a superficial nature is required. It consists not of rubbing the skin but the underlying tissues by causing the skin to glide or rub over them. By means of the ball or pulp of the operator's fingers a circular rubbing is performed without the fingers changing their position in relation to the patient's skin, but rather moving the cutaneous tissues over those underneath.

Percussion acts to a very great extent upon the superficial circulation of the parts manipulated, and consists of rapid, decisive blows delivered by the tips of the fingers or the ulnar side of the hand. The blows should be made at right angles to the long diameter of the muscle.

Oscillation consists of very rapidly imparted movements, brought about by vibrating the tips of the clustered fingers against the selected part. The finger-tips are not released from the patient's skin, and the oscillation is produced by the forearm and hand muscles.

In applying general massage it is well to follow a

routine. Either the extremities or the trunk may be first manipulated. Probably the best course is the lower and then the upper limbs, and finally, the back and abdomen. Many operators use an emollient or lubricant of some kind, but it is the author's opinion that as good if not better service may be accomplished without the aid of these greasy adjuvants. Among the more common substances employed are cocoa butter, cocoanut oil, vaselin, and sweet oil. It is well to begin massage with the stroke and then progress to the kneading and percussion.

Abdominal massage may require a little more explanation. This form of manipulation is much employed and of great import. The first requisition is a position in which the abdominal wall muscles are relaxed, and may be attained by having the patient flex the knees and thighs well, the back is made convex by introducing a pillow under the upper dorsal spine, and the patient is requested to breathe through the wide-opened mouth. Before trying to influence the intestines the superficial abdominal muscles should be worked for a short time. Friction and kneading are the better forms for employing. When the muscles have been relaxed then the attention may be directed toward the deeper tissues. To influence the small bowel, circular strokes and kneading may be performed in the center of the abdomen around the umbilicus. The large intestine or colon are treated in the same manner, but the progress must be directed along the course of this division of the intestine, namely, from the right iliac fossa upward to the liver, then crossways to the region of the spleen, and down the left side of the abdomen.

The conditions in which massage is most frequently indicated are general neurasthenia, simple anemia, chronic and some acute joint affections, sprains, sciatica, neuralgias, muscular rheumatism, myalgias, adherent scars, muscular cramps, torticollis, paralysis of various types, constipation, and certain pelvic disorders.

ELECTROTHERAPEUTICS

The use of electricity in the treatment of morbid conditions is held in disrepute by many medical men. It can be truthfully said that electricity has been asked to do too much, that it has been used many times when it should not have been, that it has been a reaping machine for charlatans. Nevertheless electricity has a legitimate place in therapeutics.

First let us consider the various forms of electricity used in medicine. The *galvanic* current is also known as the continuous or chemical current, and arises directly from the cell without the intervention of other apparatus. It is continuous, that is, flows in a steady stream without interruption or intermission. When applied to the skin it produces no sensation when flowing, except at times a feeling of warmth, but where it is broken by means of a switch or by moving the electrodes, then a perceptible influence is experienced. The *faradic* current is the current derived by passing electricity through an induction coil which is fundamentally composed of two coils of wire and an interrupter. This current is a broken current, the vibrations being very rapid. The *sinusoidal* current is a peculiar form of electricity. It is an alternating current, whose cycle is wave-like, the current gradually

ascends to its height, and then not only to the base level, but to a minimum point below the base line, and then gradually returns to the base level, thus traveling over a sine-like course. The alternations average several thousand a minute. This current is derived from the alternating dynamo current and is more smooth and less harsh and stimulating than the faradic current. The *static* current is produced by the electric influencing machine, and is a form of high potential electricity. This current is applied to the patient placed on an insulated platform. The *high-frequency* current is another form of high potential electricity. It is a current of very frequent oscillations, which may vary from one hundred thousand to a million or more per second.

The various forms of medical electricity have been enumerated, and the next point to consider is the choice of current in a given case and the action and uses of the several currents. The *galvanic* current is used when we wish to affect the nutrition of muscles which are paralyzed and do not respond to the faradic current, as in infantile paralysis and neuritis. It is also employed to bring about relief in painful neuralgic conditions, as sciatica, tic douloureux, or trigeminal neuralgia; myalgias in various forms. It is the current used in cataphoresis or the induced absorption of drugs. To accomplish this several layers of gauze are thoroughly moistened with the solution to be used and then placed on the skin. Over this gauze is put the positive pole, while the negative electrode is located elsewhere. The galvanic current is also used to produce heat in the form of a cautery. The *faradic* cur-

rent is employed to cause muscular contraction in paralyzed muscles, which will respond to this current. When very rapidly interrupted it has a sedative action and may even produce anesthesia. It is useful in hysteric paralyses and anesthetics, in organic paralyses, and as a sedative in nervous excitement and insomnia. The *sinusoidal* current may be used to produce muscular contraction in atrophy and atony of infantile paralysis, myelitis, and neuritis, and especially to stimulate the involuntary muscles in constipation, gastric atony, and uterine diseases. In neuralgias of all kinds it may prove useful. The *static* current seems to be of special value in the functional neuroses, and at times marvelous results are obtained, but who can say they are not of psychic origin. Chorea has been benefited by the application of this form of electricity. Insomnia, lowered blood-pressure, and some skin affections have been favorably impressed. The *high-frequency* current seems to have a very wide field of application. Upon general sensibilities and muscular contraction this current has but little effect, but on the blood-pressure marked changes seem to be produced. The peripheral vessels are widened, with resultant hyperemia and a fall of blood-pressure. Pain is relieved. The absorption of exuberant and morbid tissues is facilitated. This current is of value in painful conditions, as sprains, lumbago, myalgias, neuralgias, headaches, and in such affections where the absorption of inflammatory tissues is required, as in subacute and chronic rheumatism, chronic arthritic conditions, and skin disorders, as eczema, psoriasis, lupus, moles, acne, and alopecia.

DISINFECTION OF WATER

The use of pure drinking-water is a matter of supreme importance. Several epidemic diseases may be water-borne. Great outbreaks of typhoid fever, cholera, dysentery, and diarrheal diseases have been traced to the drinking of infected water.

In the town of Plymouth, Pennsylvania, a place of 8000 people, there occurred in the year 1885 a great epidemic of typhoid fever. Over 1100 of the inhabitants, or nearly one-seventh of the population, contracted the disease; 114, or over 10 per cent. of those ill, died from typhoid fever.

The water-supply of Plymouth was derived from four reservoirs located some distance from the town and on an almost uninhabited watershed.

On investigation it was found that several months before there had been a case of typhoid fever in a house located on the bank of a small stream leading into one of the reservoirs. Much of the excreta of the patient was thrown over the bank of the stream. The heavy spring freshet and rains carried the infective material into the stream and thence to the reservoirs. The great epidemic followed. This great outbreak was due to the carelessness of a nurse.

There are many other epidemics of like nature on record. It will repay the nurse to read accounts of them in Sedgwick's "Sanitary Science and Public Health."

The nurse has nothing to do with the purification of the water-supply of a municipality, but has an important duty relating to the water-supply of the home in which she is employed, especially if the drinking-water is not derived from a good general system but is

taken from wells or streams. In camp life also it is of prime importance that the water drunk be pure.

The question is, How may unsafe drinking-water be made safe? There are several efficient means of accomplishing it. Those most frequently resorted to are: (1) boiling, (2) distilling, (3) filtering, (4) hypochlorization.

Boiling.—This is probably the most rapid, economical, and best way of making unsafe drinking-water safe. If water is thoroughly boiled for fifteen minutes and then covered and placed aside to cool it may be drunk with impunity. The objection to boiled water is its flat taste. One readily becomes accustomed to this taste.

Distilling.—This is usually done by means of one of the many household stills now on the market. It is slower than the boiling method and entails the expenditure of considerable money for the purchase of the apparatus. It is nevertheless very efficient.

Filtering.—There are many forms of household filters. Some are good and many are dangerous. They require constant care. Frequent cleaning is essential. They may become foul or broken. Many are efficient. The author would rather rely on some other means of purification.

Hypochlorite Method.—In recent years the use of chlorine gas in some form for the disinfection of drinking-water has become quite common. Chlorinated lime or hypochlorite of lime has the property of killing infective organisms that may be in the water without altering its potability.

First there should be prepared a stock solution consisting of 1 teaspoonful of fresh chlorinated lime in

1 pint of water. To disinfect the water add 1 teaspoonful of the stock solution to each 10 gallons of drinking-water to be treated. Allow to stand for one-half hour and it is ready for use.

INSECTICIDES AND INSECT REPELLENTS

MOSQUITO

Fumes.—These are used for the purpose of ridding a house or room of mosquitos.

Pyrethrum has been employed extensively for this purpose. It may be burned in a room or the powder may be blown into the air. For use as a fumigant the powder should be piled on a metal dish and some alcohol sprinkled over it and then lighted. The fumes from pyrethrum do not kill the insects, but rather stun or stupefy them. The mosquitos fall to the floor and should be collected at once before life returns. The room should be tightly closed. One pound of pyrethrum should be used for each 1000 cubic feet of space to be fumigated.

Mimm's culicide is prepared by rubbing together in the presence of heat equal parts of carbolic acid and gum camphor. To use, vaporize over a lamp or stove 4 ounces of the liquid to every 1000 cubic feet of space.

Sulphur is an excellent insecticide. The objections to its use are that it bleaches colors and tarnishes metals, as brass and silver. Two pounds of sulphur should be burned in a room of 1000 cubic feet.

Personal Protection.—Many substances have been recommended for the purpose of keeping away the mosquito from the individual. Oils of citronella, lavender, pennyroyal, and cassia have all been tried.

Oil of citronella is probably as good as any. It should be mixed with some fixed oil to prevent rapid evaporation. A combination of 1 part oil of citronella and 5 parts of albolene (petrolatum liquidum) may be applied to the exposed parts of the body.

Remedies against the bite may be mentioned here. Application of the following may help: Solution of potassium permanganate, hydrogen peroxid, ammonia water, iodine, or glycerin.

HOUSE FLY

Pyrethrum used as described above also acts well against the house fly.

Formalin in water in the proportion of 1 part of formalin to 50 parts of water acts as an efficient poison. Several dishes containing some of this solution should be placed in various parts of the room. A pinch of sugar added to each dish will greatly facilitate the power of fly decoying.

BEDBUG

Sulphur fumigation sometimes does admirably well in ridding an apartment of bedbugs. The objection to its use are the bleaching of colors and the tarnishing of metals.

Benzine, gasoline, and naphtha if sprayed in the cracks of beds and the crevices of floors and walls may prove useful. Care should be taken in using these inflammable liquids.

COCKROACH

Sulphur fumigation is very satisfactory. Two pounds of sulphur should be burned for every 1000 cubic feet of space.

Borax powder dusted about is an excellent remedy against this vermin. The author has found borax most efficient.

Sodium fluorid or fluorol has been used with success. It should be mixed with an equal amount of starch or fine meal and dusted about the infested places.

Note.—It should be remembered that although formaldehyd fumigation acts well as a disinfectant, it is a very poor insecticide.

PART VI

ADDENDA

STRENGTH OF DRUG PREPARATIONS

	PER CENT.		PER CENT.
Cerates.		Extracts.	
Camphor,	2	Euonymus,	400
Cantharides,	32	Gentian,	250
Lead Subacetate,	20	Hematoxylon,	—
Resin,	35	Hyoscyamus,	0.25 ¹
Simple,	—	Jalap (Resin),	60
Spermaceti,	2	Krameria,	—
Decoctions.		Leptandra,	400
Cetraria,	5	Licorice,	—
Sarsaparilla Compound,	10	Malt,	—
Emulsions.		Nux Vomica,	16.00 ¹
Almond,	6	Opium,	20 ¹
Ammoniac,	4	Physostigma,	2 ¹
Asafetida,	4	Quassia,	1000
Chloroform,	4	Rhubarb,	—
Extracts.		Scopola,	2 ¹
Aloes,	—	Stramonium,	1.00 ¹
Belladonna,	1.25 ¹	Sumbul,	—
Cannabis Indica,	800	Taraxacum,	—
Cascara,	400	Fluidextracts.	
Cimicifuga,	800	All fluidextracts are of the	
Colchicum Root,	1.4 ¹	same strength— <i>i. e.</i> , 1	
Colocynth,	600	minim = 1 grain of the	
Digitalis,	—	drug—except the follow-	
Ergot,	500	ing :	

¹ Average percentage of the principal alkaloid.

	PER CENT.		PER CENT.
Fluidextracts.		Liniments.	
Aconite,	0.5 ¹	Soap,	6
Belladonna Root,	0.45 ¹	Soft,	65
Cinchona,	4.5 ¹	Turpentine,	35
Coca,	0.5 ¹	Masses.	
Colchicum Seed,	0.4 ¹	Copaiba,	94
Conium,	0.5 ¹	Iron Carbonate—Vallet's,	50
Gelsemium,	0.3 ¹	Mercury,	33
Hydrastis,	2.0 ¹	Mixtures.	
Hyoscyamus,	0.065 ¹	Chalk,	20
Ipecac,	2.0 ¹	Iron Compound (Sulphate),	0.7
Nux Vomica,	2.5 ¹	Licorice Compound,	—
Pilocarpus,	0.6 ¹	Rhubarb and Soda,	1.5
Scopola,	0.5 ¹	Mucilages.	
Stramonium,	0.35 ¹	Acacia,	34
Glycerites.		Elm,	6
Boroglycerid,	31	Sassafras,	2
Carbolic Acid,	20	Tragacanth,	6
Hydrastis,	1.25 ¹	Ointments.	
Starch,	10	Belladonna,	10
Tannic Acid,	20	Carbolic Acid,	2.00
Yolk of Egg,	4.5	Chrysarobin,	6
Honey.		Diachylon,	50
Rose,	12	Iodin,	4
Infusions.		Iodoform,	10
Cinchona,	6	Lead Carbonate,	10
Digitalis,	1.5	Iodid,	10
Senna Compound,	6	Mercury,	50
Wild Cherry,	4	Ammoniated,	10
Liniments.		Nitrate,	—
Ammoniac,	35	Oxid, Red,	10
Belladonna,	95	Yellow,	10
Camphor,	20.00	Nutgall,	20
Chloroform,	30	Potassium Iodid,	10
Lime,	50	Rose-water (Cold Cream),	—
Mustard Compound,	3	Stramonium,	10

¹ Average percentage of the principal alkaloid.

Ointments.		PER CENT.	Solutions.		PER CENT.
Sulphur,		15	Iron Nitrate,		1.4 ²
Veratrin,		4	Subsulphate,		13.6 ²
Zinc Oxid,		20	Tersulphate,		10
Oleates.			Lead Subacetate,		25
Atropin,		2	Dilute,		1
Cocain,		5	Lime,		1.7
Mercury,		25	Mercury Nitrate,		60
Quinin,		25	Potassium Arsenite,		1
Veratrin,		2	Citrate,		8
Zinc,		5	Hydrate,		5
Plasters.			Sodium Arsenate,		1
Ammoniac and Mercury,	30		Hydrate,		5
Arnica,	33		Hypochlorite (Chlorin),	2.6	
Belladonna,	0.4 ¹		Zinc Chlorid,	50	
Capsicum,	Indefinite.		Spirits.		
Iron,	9		Almond, Bitter,		1
Isinglass,	—		Ammonia,		10
Lead,	—		Aromatic,		3.4 ⁴
Mercury,	30		Anise,		10
Opium,	6		Camphor,		10
Pitch, Burgundy,	80		Chloroform,		6
Cantharidal,	8		Cinnamon,		10
Resin,	14		Ether,		32.5
Soap,	10		Compound,		32.5
Solutions.			Nitrous,		4 ⁵
Ammonium Acetate,	7		Frumenti (Whisky),	37-47.5 ⁶	
Arsenous Acid,	1		Gaultheria,		5
Arsen. and Merc. Iodids,	1		Juniper,		5
Iodin Compound,	5		Compound,		0.8
Iron Acetate,	7.5 ³		Lavender,		5
and Ammonium Acetate,	4 ³		Lemon,		5
Chlorid,	10 ³		Nitroglycerin,		1
Citrate,	7.5 ³		Nutmeg,		5
			Peppermint,		10

¹ Average percentage of the principal alkaloid.² Percentage of metallic iron.³ Percentage of tincture of iron chlorid.⁴ Percentage of ammonium carbonate.⁵ Percentage of ethyl nitrite.⁶ Percentage of absolute alcohol.

	PER CENT.
Spirits.	
Phosphorus,	0.12
Spearmint,	10
Vini Gallici (Brandy),	39-47 ¹

Syrups.	
Acacia,	12.5
Almonds,	18
Blackberry,	25
Citric Acid,	1
Garlic,	20
Ginger,	3
Hydriodic Acid,	1.38
Ipecac,	7
Iron Iodid,	5
Krameria,	45
Lactucarium,	10
Lime,	6.5
Marshmallow,	5
Orange,	5
Rhubarb,	10
Rose,	12.5
Sarsaparilla Compound,	20
Senega,	20
Squill,	45 ²
Tar,	7.5
Tolu,	1
Wild Cherry,	15

Tinctures.

All tinctures are of 20 per cent. strength except the following :

Aconite,	0.05 ³
Aloes,	10
and Myrrh,	10
Arnica Root,	10
Belladonna Leaves,	0.03 ³
Benzoin Compound,	10

Tinctures.

	PER CENT.
Bryonia,	10
Cannabis Indica,	10
Cantharides,	10
Capsicum,	10
Chirata,	10
Colchicum Seed,	0.04 ³
Digitalis,	10
Gelsemium,	10
Gentian Compound,	10
Hyoscyamus,	0.006 ³
Iodin,	7
Ipecac and Opium,	10
Iron Chlorid,	13.6
Kino,	5
Lactucarium,	50
Lemon,	50
Lobelia,	10
Matico,	10
Musk,	5
Nux Vomica,	0.25 ³
Opium,	1.00 ³
Camphorated,	0.4
Deodorized,	10
Physostigma,	0.015 ³
Sanguinaria,	10
Squill,	10
Stramonium,	0.025 ³
Strophanthus,	10
Sumbul,	10
Veratrum Viride,	10

Vinegars.

Opium,	10
Squill,	10

Waters.

Almond, Bitter,	0.1
Ammonia,	10
Strong,	28

¹ Percentage of absolute alcohol.

² Percentage of vinegar of squill.

³ Average percentage of the principal alkaloid.

Waters.		PER CENT.	Waters.		PER CENT.
Anise,		0.2	Spearment,		0.2
Camphor,		0.8	Wines.		
Chlorin,		0.4		Antimony,	0.4
Chloroform,		0.5		Colchicum Root,	40
Cinnamon,		0.2		Seed,	10
Creosote,		1		Ergot,	20
Fennel,		0.2		Ipecac,	10
Hydrogen Dioxid,		3		Iron, Bitter,	5
Orange Flower,		—		Citrate,	4
Peppermint,		0.2		Opium,	10
Rose,		—		Red,	7-12 ¹
Strong,	Saturate,			White,	7-12 ¹

¹ Percentage of absolute alcohol.

SYNONYMS

- Absinth—Wormwood.
 Acetanilid—Antifebrin, phenyl-acetamid.
 Aconite—Wolfsbane, monkshood.
 Adonis Vernalis—False hellebore.
 Allium—Garlic.
 Allspice—Pimenta.
 Althæa—Marshmallow.
 Ammonium Chlorid—Sal ammo-niac.
 Amylum—Starch.
 Anthemis—Roman camomile.
 Antifebrin—Acetanilid.
 Apium—Celery.
 Apocynum—Canada hemp.
 Arbor Vitæ—Thuja.
 Argentum Nitrate—Silver nitrate.
 Asclepias—Pleurisy root.
 Aspidium—Male fern, Filix mas.
 Avena Sativa—Oats.
 Baptisia—Wild indigo.
 Barosma—Buchu.
 Bearberry—Uva Ursi.
 Belladonna—Deadly nightshade.
 Black Haw—Viburnum Prunifolium.
 Snakeroot—Cimicifuga.
 Bladder Wrack—Fucus Vesiculosus.
 Bloodroot—Sanguinaria.
 Blue Flag—Iris.
 Vitriol—Copper sulphate.
 Boneset—Eupatorium.
 Broom-tops—Scoparius.
 Buchu—Barosma.
 Buckthorn—Rhamnus Frangula.
 Burdock—Lappa.
 Butter Nut—Juglans.
 Cactus—Night-blooming cereus.
 Calabar Bean—Physostigma.
 Calamus—Sweet flag.
 Calendula—Marigold.
 Canada Hemp—Apocynum.
 Cannabis Indica—Indian hemp.
 Cantharides—Spanish fly.
 Capsicum—Cayenne or red pepper.
 Caraway—Carum.
 Carbo Ligni—Charcoal.
 Carbolic Acid—Phenol, phenic acid.
 Caryophyllus—Clove.
 Cascara—Rhamnus Purshiana.
 Cassia—Cinnamon.
 Castanea—Chestnut.
 Castor Oil—Oleum Ricini.
 Caulophyllum—Blue Cohosh.
 Celery—Apium.
 Cereus—Cactus.
 Chamomile, German—Matricaria.
 Roman—Anthemis.
 Charcoal—Carbo ligni.
 Chenopodium—American wormseed.
 Chestnut—Castanea.
 Chimaphila—Pipsissewa.
 Chionanthus—Fringe-tree.
 Cimicifuga—Black snakeroot, black cohosh.
 Cinnamon—Cassia.

Claviceps—Ergot.
 Clove—Caryophyllus.
 Cochlearia—Horse-radish.
 Cohosh, Black—Cimicifuga.
 Blue—Caulophyllum.
 Cola—Kola.
 Colchicum—Meadow saffron.
 Conium—Poison hemlock.
 Convallaria—Lilly of the valley.
 Corn-silk—Zea Mays.
 Couch Grass—Triticum.
 Cranesbill—Geranium.
 Cream of Tartar—Potassium bi-
 tartrate.
 Creta—Chalk.
 Culver's Root—Leptandra.
 Cusso—Kousso.
 Dandelion—Taraxacum.
 Delphinium — Stavesacre, lark-
 spur.
 Digitalis—Fox-glove.
 Dock, yellow—Rumex.
 Dog grass—Triticum.
 Dover's Powder — Powder of
 ipcac and opium.
 Elm—Ulmus.
 Epsom Salt — Magnesium sul-
 phate.
 Ergot—Claviceps Purpurea.
 Erigeron—Canada fleabane.
 Eriodictyon—Yerba Santa.
 Erythroxylon—Coca.
 Euonymus—Wahoo.
 Eupatorium—Boneset.
 False Hellebore — Adonis Ver-
 nalis.
 Fels Bovis—Ox-gall.
 Filix mas—Aspidium, male fern.

Fleabane, Canada—Erigeron.
 Fox-glove—Digitalis.
 Fringe-tree—Chionanthus.
 Fucus—Bladder or sea wrack.
 Garlic—Allium.
 Gaultheria—Wintergreen.
 Gelsemium—Yellow jasmine.
 Geranium—Cranesbill.
 Ginger—Zingiber.
 Glauber Salt—Sodium sulphate.
 Glycyrrhiza—Licorice.
 Golden Rod—Solidago.
 Seal—Hydrastis.
 Green Vitriol—Iron sulphate.
 Hematoxylon—Logwood.
 Hamamelis—Witch hazel.
 Hedeoma—Pennyroyal.
 Hellebore, American—Veratrum
 Viride.
 False—Adonis Vernalis.
 Green—Veratrum Viride.
 Helonias—False unicorn.
 Hemlock, Poison—Conium.
 Hemp, Canada—Apocynum.
 Indian—Cannabis Indica.
 Henbane—Hyoscyamus.
 Hops—Humulus.
 Horse-radish—Cochlearia.
 Humulus—Hops.
 Hydrastis—Golden seal.
 Hydrochloric Acid—Muriatic acid.
 Hydrocyanic Acid—Prussic acid.
 Hyoscyamus—Henbane.
 Indigo, Wild—Baptisia.
 Iris—Blue flag.
 Jaborandi—Pilocarpus.
 Jasmine, Yellow—Gelsemium.
 Juglans—Butternut.

- Kola—Cola.
 Koussou—Cusso.
 Krameria—Rhatany.

 Lactose—Milk-sugar.
 Lactucarium—Lettuce.
 Lady Slipper—Cypripedium.
 Lappa—Burdock.
 Larkspur—Delphinium, Staves-
 acre.
 Lavender—Lavandula.
 Leptandra—Culver's root.
 Lettuce—Lactucarium.
 Licorice—Glycyrrhiza.
 Lily of the Valley—Convallaria.
 Logwood—Hematoxylon.

 Male Fern—Aspidium, Filix mas.
 Mandrake—Podophyllum, May
 apple.
 Marigold—Calendula.
 Marshmallow—Althæa.
 Matricaria—German camomile.
 May Apple—Podophyllum.
 Mentha Piperita—Peppermint.
 Viridis—Spear-mint.
 Monkshood—Aconite.
 Muriatic Acid—Hydrochloric
 acid.
 Muskroot—Sumbul.
 Myristica—Nutmeg.

 Night-blooming Cereus—Cactus.
 Nightshade, Deadly—Belladonna.
 Nutmeg—Myristica.

 Oak—Quercus.
 Oats—Avena Sativa.

 Passiflora—Passion flower.
 Pennyroyal—Hedeoma.

 Pepo—Pumpkin seeds.
 Pepper, Cayenne—Capsicum.
 Peppermint—Mentha Piperita.
 Peruvian Bark—Cinchona.
 Petrolatum—Vaselin.
 Phenazone—Antipyrin.
 Phenol—Carbolic acid.
 Phenylacetamid—Acetanilid.
 Physostigma—Calabar bean.
 Physostigmin—Eserin.
 Phytolacca—Poke root or berry.
 Pilocarpus—Jaborandi.
 Pimenta—Allspice.
 Pink-root—Spigelia.
 Pipsissewa—Chimaphila.
 Pix Liquida—Tar.
 Pleurisy Root—Asclepias.
 Podophyllum—Mandrake, May
 apple.
 Poke Root or Berry—Phytolacca.
 Prickly Ash—Xanthoxylon.
 Prunus Virginiana—Wild cherry.
 Prussic Acid—Hydrocyanic acid.
 Pumpkin Seeds—Pepo.

 Quercus—Oak.

 Rhamnus Frangula—Buckthorn.
 Purshiana—Cascara.
 Rhatany—Krameria.
 Rheum—Rhubarb.
 Rochelle Salt—Sodium and potas-
 sium tartrate.
 Rumex—Yellow dock.

 Sabina—Savin.
 Saffron, Meadow—Colchicum.
 Sage—Salvia.
 Sal Ammoniac—Ammonium chlo-
 rid.
 Salix—Willow.

Salvia—Sage.
 Sanguinaria—Blood-root.
 Santonica—Levant wormseed.
 Sarsaparilla—Smilax.
 Savin—Sabina.
 Scilla—Squill.
 Scoparius—Broom tops.
 Sea Wrack—Fucus.
 Serpentaria—Virginia snakeroot.
 Sinapis—Mustard.
 Smilax—Sarsaparilla.
 Snakeroot, Black—Cimicifuga.
 Virginia—Serpentaria.
 Sodium Borate—Borax.
 Solidago—Golden rod.
 Spanish Fly—Cantharides.
 Spearmint—Mentha Viridis.
 Spigelia—Pink-root.
 Squill—Scilla.
 Starch—Amylum.
 Star Grass—True unicorn root.
 Stavesacre—Delphinium.
 Stramonium—Jamestown weed.
 Sumbul—Muskroot.
 Sweet Flag—Calamus.

 Taraxacum—Dandelion.
 Tartar Emetic—Potassium and
 antimony tartrate.
 Tea—Thea.

Thea—Tea.
 Thuja—Arbor Vitæ.
 Triticum—Dog or couch grass.

 Ulmus—Elm.
 Unicorn Root, False—Helonias.
 True—Star grass.
 Uva Ursi—Bearberry.

 Veratrum Viride—American or
 green hellebore.
 Viburnum Opulus—Cramp bark.
 Prunifolium—Black haw.

 Wahoo—Euonymus.
 Wild Cherry—Prunus Virginiana.
 Willow—Salix.
 Wintergreen—Gaultheria.
 Witch Hazel—Hamamelis.
 Wormseed, American—Chenopo-
 dium.
 Levant—Santonica.
 Wormwood—Absinth.

 Xanthoxylon—Prickly ash.

 Yellow Jessamine—Gelsemium.
 Yerba Santa—Eriodictyon.

 Zea Mays—Corn-silk.
 Zingiber—Ginger.

WEIGHTS AND MEASURES

TABLES OF EQUIVALENTS

$\frac{1}{100}$ grain = 0.0006 gram.	0.001 gram = $\frac{1}{64}$ grain.
$\frac{1}{60}$ " = 0.00108 "	0.0015 " = $\frac{1}{40}$ "
$\frac{1}{50}$ " = 0.0013 "	0.002 " = $\frac{1}{32}$ "
$\frac{1}{30}$ " = 0.00216 "	0.003 " = $\frac{1}{20}$ "
$\frac{1}{25}$ " = 0.00259 "	0.005 " = $\frac{1}{12}$ "
$\frac{1}{10}$ " = 0.006 "	0.006 " = $\frac{1}{10}$ "
$\frac{1}{8}$ " = 0.0081 "	0.0081 " = $\frac{1}{8}$ "
$\frac{1}{6}$ " = 0.011 "	0.011 " = $\frac{1}{6}$ "
$\frac{1}{4}$ " = 0.016 "	0.016 " = $\frac{1}{4}$ "
$\frac{1}{2}$ " = 0.032 "	0.032 " = $\frac{1}{2}$ "
1 " = 0.062 "	0.0486 " = $\frac{3}{4}$ "
5 grains = 0.324 "	0.0567 " = $\frac{7}{8}$ "
8 " = 0.52 "	0.062 " = 1 "
1 dram = 3.89 grams.	0.1 " = $1\frac{1}{2}$ grains.
1 ounce = 31.10 "	1 " = 15.43 "
0.06 cc. = 1 minim.	1 minim = 0.06 cc.
0.25 " = 4.06 minims.	2 minims = 0.12 "
0.5 " = 8.11 "	3 " = 0.18 "
1 " = 16.23 "	5 " = 0.3 "
3 " = 48.6 "	8 " = 0.5 "
5 " = 1.35 drams.	30 " = 1.90 "
30 " = 1 ounce.	1 dram = 3.75 "
100 " = 3.38 ounces.	1 ounce = 30 "
1000 " = 33.81 "	4 ounces = 118.40 "

APOTHECARIES' MEASURE

60 minims	= 1 fluidram.
8 fluidrams	= 1 fluidounce.
16 fluidounces	= 1 pint.
8 pints	= 1 gallon.

DOMESTIC MEASURES

(These are only Approximate)

1 teaspoonful	=	about 1 dram	or	4 cubic centimeters (cc.).
1 dessertspoonful	=	" 2 drams	or	8 " "
1 tablespoonful	=	" $\frac{1}{2}$ ounce	or	15 " "
1 wineglassful	=	" 2 ounces	or	60 " "
1 teacupful	=	" 5 ounces	or	150 " "

SOLUTION TABLE

These estimates are approximate, to avoid small fractional weights.

Percentage strength.	Parts.	Amount of the substance to make		
		1 pint.	1 ounce.	4 ounces.
$\frac{1}{10}$ of 1	1 to 1000	7 $\frac{1}{2}$ gr.	$\frac{1}{2}$ gr.	2 gr.
$\frac{1}{5}$ of 1	1 to 500	15 "	1 "	4 "
$\frac{1}{2}$ of 1	1 to 200	38 "	2 $\frac{1}{2}$ "	9 $\frac{1}{2}$ "
1	1 to 100	76 $\frac{1}{2}$ "	4 $\frac{3}{10}$ "	19 "
2	1 to 50	153 "	9 $\frac{1}{2}$ "	38 "
5	1 to 20	384 "	24 "	96 "
10	1 to 10	768 "	48 "	192 "
20	1 to 5	1536 "	96 "	384 "
25	1 to 4	1920 "	120 "	480 "
33 $\frac{1}{3}$	1 to 3	2560 "	160 "	640 "
50	1 to 2	3840 "	240 "	960 "

THERMOMETRIC EQUIVALENTS AND CONVERSIONS
EQUIVALENTS

Fahr.	Cent.	Fahr.	Cent.	Fahr.	Cent.
32° =	0.0°	80.0° =	26.8°	104° =	40.0°
50° =	10.5°	90.0° =	32.4°	110° =	43.5°
60° =	16.0°	98.6° =	37.0°	150° =	65.5°
70° =	21.5°	100.0° =	37.8°	212° =	100.0°

CONVERSIONS

Fahrenheit to Centigrade.—From the Fahrenheit reading deduct 32, multiply this difference by 5, and divide the result by 9. Example: Convert 212° F. into C. 212 minus 32 equals 180; 180 times 5 equals 900; 900 divided by 9 equals 100° C.

Centigrade to Fahrenheit.—Multiply the Centigrade reading by 9, divide the result by 5, and add 32. Example: Convert 37° C. into F. 37 times 9 equals 333; 333 divided by 5 equals 66.6; 66.6 plus 32 equals 98.6° F.

DRUG DOSAGE TABLE

DRUGS.	C.c. or grams.	Minims or grains.
Acetanilid.	.13-.65	2-10
Acid, arsenous.	.0011-.0032	$\frac{60}{10}$ - $\frac{20}{5}$
benzoic.	.324-.972	5-15
boric.	.324-.972	5-15
gallic.	.065-.972	1-15
hydrochloric, dilute.	.308-1.84	5-30
nitric, dilute.	.308-1.23	5-20
nitrohydrochloric.	.062-.308	1-5
phosphoric, dilute.	.616-3.70	10-60
salicylic.	.324-1.95	5-30
tannic.	.065-3.24	1-5
Aconitin.	.00010-.00032	$\frac{60}{10}$ - $\frac{20}{5}$
Adonidin.	.0065-.013	$\frac{10}{10}$ - $\frac{5}{5}$
Aloin.	.016-.032	$\frac{1}{4}$ -2
Alum.	.324-1.95	5-30
Ammonium benzoate.	.65-1.95	10-30
bromid.	.972-1.95	15-30
carbonate.	.324-1.95	5-30
chlorid.	.324-.972	5-30
hyposulphite.	.065-.195	1-3
iodid.	.324-1.95	5-30
salicylate.	.13-.398	2-6
valerianate.	.13-.518	2-8
Amyl nitrite.	.062-.308	1-5
Antimony and potassium tartrate.	.0022-.011	$\frac{10}{10}$ - $\frac{1}{5}$
Antipyrin.	.324-.972	5-15
Apiol.	.062-.308	1-5
Apomorphin.	.0011-.008	$\frac{10}{10}$ - $\frac{1}{5}$
Aspirin.	.324-.972	5-15
Atropin.	.00054-.0011	$\frac{120}{120}$ - $\frac{10}{10}$
Bismuth benzoate.	.324-.972	5-15
salicylate.	.13-.388	2-6
subcarbonate.	.324-1.95	5-30
subgallate.	.26-.52	4-8
subnitrate.	.324-2.6	5-40
tannate.	.65-1.95	10-30
Butyl-chloral hydrate.	.13-.972	2-15
Caffein.	.032-.324	$\frac{1}{2}$ -5
citrated.	.13-.65	2-10
and sodium benzoate.	.13-.65	2-10

DRUGS.	C.c. or grams.	Minims or grains.
Calcium bromid.....	.324-1.3	5-20
chlorid.....	.324-1.3	5-20
glycerophosphate.....	.13-.324	2-5
hypophosphite.....	.324-1.3	5-20
sulphid.....	.0065-.032	$\frac{1}{10}$ - $\frac{1}{2}$
Calomel.....	.0065-.65	$\frac{1}{10}$ -10
Camphor.....	.13-.324	2-5
monobromated.....	.13-.324	2-5
Cannabin tannate.....	.065-.65	1-10
Cascarin.....	.016-.065	$\frac{1}{4}$ -1
Castor oil.....	3.70-59.14	60-960
Cerium oxalate.....	.065-.324	1-5
Chloral hydrate.....	.324-1.3	5-20
Chloralamid.....	.924-2.46	15-40
Cocain.....	.016-.13	$\frac{1}{4}$ -2
Codein salts.....	.016-.13	$\frac{1}{4}$ -2
Codliver oil.....	3.70-14.79	60-240
Colchicin.....	.00054-.0022	$\frac{1}{120}$ - $\frac{1}{30}$
Cotarnine hydrochlorid.....	.032-.26	$\frac{1}{2}$ -4
Creosote.....	.03-.324	$\frac{1}{2}$ -5
carbonate (creosotal).....	.308-1.23	5-20
Digitalin.....	.0013-	$\frac{1}{50}$ -
Dionin.....	.016-.065	$\frac{1}{4}$ -1
Diuretin.....	.324-1.3	5-20
Dover's powder.....	.194-.972	3-15
Emetin.....	.0055-.0011	$\frac{1}{12}$ - $\frac{1}{60}$
Ergotin.....	.065-.65	1-10
Eserin.....	.00054-.0026	$\frac{1}{120}$ - $\frac{1}{40}$
Eucalyptol.....	.308-.616	5-10
Exalgin.....	.065-.26	1-4
Extract, aconite.....	.008-.032	$\frac{1}{8}$ - $\frac{1}{2}$
aloes.....	.065-.324	1-5
belladonna.....	.008-.032	$\frac{1}{8}$ - $\frac{1}{2}$
cannabis indica.....	.008-.065	$\frac{1}{8}$ -1
cascara sagrada.....	.065-.398	1-6
colocynth.....	.032-.13	$\frac{1}{2}$ -2
ergot.....	.324-.972	5-15
hyoscyamus.....	.032-.194	$\frac{1}{2}$ -3
nux vomica.....	.008-.032	$\frac{1}{8}$ - $\frac{1}{2}$
opium.....	.008-.065	$\frac{1}{8}$ -1
physostigma.....	.0055-.032	$\frac{1}{12}$ - $\frac{1}{2}$
rhubarb.....	.065-.324	1-5
Fluidextract, aconite.....	.015-.062	$\frac{1}{4}$ -1
adonis vernalis.....	.062-.124	1-2

DRUGS.	C.c. or grams.	Minims or grains.
Fluidextract, apocynum.....	.124-.62	2-10
belladonna.....	.03-.124	$\frac{1}{2}$ -2
cactus.....	.124-.308	2-5
coca.....	3.70-7.39	60-120
colchicum root.....	.124-.493	2-8
seed.....	.185-.616	3-10
convallaria.....	.308-1.23	5-20
corn silk.....	1.84-7.39	30-120
digitalis.....	.03-.185	$\frac{1}{2}$ -3
ergot.....	1.84-7.39	30-120
grindelia.....	.924-3.70	15-60
ippecac.....	.03-.616	$\frac{1}{2}$ -10
scoparius.....	.616-3.70	10-60
Gelsemine.....	.00054-.0011	$\frac{1}{120}$ - $\frac{1}{60}$
Guaiacol.....	.03-.616	$\frac{1}{2}$ -10
carbonate (duotal).....	.065-.518	1-8
salicylate.....	.324-.195	5-30
valerianate.....	.185-.616	3-10
Heroin.....	.0028-.0055	$\frac{1}{24}$ - $\frac{1}{12}$
Hexamethylenamin.....	.324-.518	5-8
Hydrastin.....	.016-.065	$\frac{1}{4}$ -1
Hyoscin.....	.00016-.00065	$\frac{1}{400}$ - $\frac{1}{100}$
Hyoscyamin.....	.00054-.0011	$\frac{1}{120}$ - $\frac{1}{60}$
Ichthyol.....	.185-.924	3-15
Infusion, buchu.....	3.70-14.79	60-240
cinchona.....	3.70-14.79	60-240
digitalis.....	3.70-14.79	60-240
quassia.....	3.70-29.57	60-480
senna, compound.....	3.70-29.57	60-480
Iron arsenate.....	.004-.008	$\frac{1}{15}$ - $\frac{1}{8}$
bromid.....	.065-.324	1-5
carbonate, mass (Blaud's).....	.065-.324	1-5
chlorid, tincture.....	.308-3.70	5-60
iodid, syrup.....	3.08-1.84	5-30
reduced.....	.065-.324	1-5
sulphate.....	.032-.13	$\frac{1}{2}$ -2
valerianate.....	.065-.324	1-5
Lead acetate.....	.032-.13	$\frac{1}{2}$ -2
iodid.....	.065-.26	1-4
Lime-water.....	3.70-59.14	60-960
Lithium benzoate.....	.324-1.3	5-20
salicylate.....	.65-1.95	10-30
Magnesium sulphate.....	3.89-31.12	60-480
Manganese dioxid.....	.065-.65	1-10

DRUGS.	C.c. or grams.	Minims or grains.
Manganese hypophosphite	.194-.65	3-10
sulphate	.065-.65	1-10
Menthol	.065-.324	1-5
Mercury bichlorid	.0011-.0055	$\frac{1}{80}$ - $\frac{1}{2}$
biniodid	.004-.008	$\frac{1}{16}$ - $\frac{1}{8}$
protoiodid	.016-.065	$\frac{1}{4}$ -1
with chalk	.032-.65	$\frac{1}{2}$ -10
Methyl salicylate	.308-.924	5-15
Methylene-blue	.065-.26	1-4
Mixture, Basham's	3.70-14.79	60-240
Brown	3.70-14.79	60-240
chalk	3.70-14.79	60-240
licorice, compound	3.70-14.79	60-240
rhubarb and soda	3.70-14.79	60-240
Morphin salts	.0055-.016	$\frac{1}{12}$ - $\frac{1}{4}$
Nitroglycerin	.00065-.0026	$\frac{1}{16}$ - $\frac{1}{25}$
Oil, castor	3.70-59.14	60-960
codliver	3.70-14.79	60-240
croton	.015-.062	$\frac{1}{4}$ -1
erigeron	.308-.616	5-10
eucalyptus	.308-.616	5-10
gaultheria	.308-1.23	5-20
santal wood	.308-1.23	5-20
turpentine	.308-1.84	5-30
Oxgall, inspissated	.324-.972	5-15
Pancreatin	.324-.972	5-15
Paraldehyd	1.84-3.70	30-60
Pepsin	.324-.972	5-15
Phenacetin (acetphenetidin)	.065-.65	1-10
Physostigmin	.00054-.0016	$\frac{1}{120}$ - $\frac{1}{40}$
Pilocarpin	.0055-.016	$\frac{1}{12}$ - $\frac{1}{4}$
Podophyllin	.008-.032	$\frac{1}{8}$ - $\frac{1}{2}$
Potassium acetate	.324-3.89	5-60
and sodium tartrate	3.89-31.12	60-480
bicarbonate	.65-3.89	10-60
bichromate	.004-.011	$\frac{1}{16}$ - $\frac{1}{8}$
bitartrate	1.3-15.56	20-240
bromid	.324-3.89	5-60
chlorate	.065-.26	1-4
citrate	.324-1.95	5-30
iodid	.324-3.89	5-60
nitrate	.194-.324	3-5
permanganate	.032-.194	$\frac{1}{2}$ -3
Powder, catechu, compound	.324-1.3	5-20

DRUGS.	C.c. or grams.	Minims or grains.
Powder, chalk, compound.....	.324-1.95	5-30
gray.....	.032-.65	$\frac{1}{2}$ -10
ipecac and opium (Dover's).....	.194-.972	3-15
jalap, compound.....	.972-3.89	15-60
opium.....	.016-.13	$\frac{1}{4}$ -2
rhubarb, compound.....	.972-3.89	15-60
Quinin salts.....	.032-1.3	$\frac{1}{2}$ -20
Resorcin.....	.065-.194	1-3
Rochelle salt.....	3.89-31.12	60-480
Saccharin.....	.13-.398	2-6
Salicin.....	.324-1.95	5-30
Salol.....	.065-.65	1-10
Salophen.....	.324-.972	5-15
Santonin.....	.016-.13	$\frac{1}{4}$ -2
Silver nitrate.....	.008-.032	$\frac{1}{8}$ - $\frac{1}{2}$
Sodium benzoate.....	.324-3.89	5-60
biborate (borax).....	.324-1.95	5-30
bicarbonate.....	.65-7.78	10-120
bromid.....	.65-3.89	10-60
cacodylate.....	.032-.13	$\frac{1}{2}$ -2
citrate.....	.324-1.3	5-20
hyposulphite.....	.324-1.3	5-20
iodid.....	.324-3.89	5-60
nitrite.....	.032-.13	$\frac{1}{2}$ -2
phosphate.....	.65-3.89	10-60
salicylate.....	.324-1.95	5-30
sulphate.....	3.89-31.12	60-480
sulphite.....	.324-1.95	5-30
sulphocarbonate.....	.13-3.89	2-5
valerianate.....	.065-3.89	1-5
Solution, ammonium acetate.....	3.70-14.79	60-240
arsenic and mercury iodid.....	.062-.616	1-10
arsenous acid.....	.062-.616	1-10
Donovan's.....	.062-.616	1-10
Fowler's.....	.062-.616	1-10
iron and ammonium acetate.....	3.70-14.79	60-240
Pearson's.....	.062-.616	1-10
potassium arsenite.....	.062-.616	1-10
sodium arsenate.....	.062-.616	1-10
Sparteïn sulphate.....	.008-.032	$\frac{1}{8}$ - $\frac{1}{2}$
Spirit, ammonia, aromatic.....	1.84-7.39	30-120
camphor.....	.924-3.70	15-60
ether, compound.....	.308-3.70	5-60
nitrous.....	.924-3.70	15-60

DRUGS.	C.c. or grams.	Minims or grains.
Spirit, gaultheria.....	1.84-7.39	30-120
glonoin.....	.062-.185	1-3
mindereus.....	3.70-14.79	60-240
Strontium bromid.....	.324-1.95	5-30
iodid.....	.324-.65	5-10
lactate.....	.324-1.3	5-20
salicylate.....	.65-1.3	10-20
Strophanthin.....	.00032-.00065	$\frac{1}{200}$ - $\frac{1}{100}$
Strychnin salts.....	.00065-.0022	$\frac{1}{100}$ - $\frac{1}{30}$
Sulfonal.....	.65-1.95	10-30
Syrup, calcium lactophosphate.....	1.84-3.70	30-60
ipacac.....	.616-3.70	10-60
squill, compound.....	.324-1.84	5-30
Tartar emetic.....	.0022-.032	$\frac{1}{30}$ - $\frac{1}{2}$
Terpin hydrate.....	.13-.324	2-5
Thymol.....	.065-6.5	1-10
Thyroid extract.....	.016-6.5	$\frac{1}{4}$ -1
Tincture, aconite.....	.062-.185	1-3
catechu, compound.....	1.84-7.39	30-120
cinchona.....	1.84-7.39	30-120
digitalis.....	.308-1.84	5-30
gelsemium.....	.616-1.84	10-30
hyoscyamus.....	1.84-7.39	30-120
iodin.....	.062-.308	1-5
iron chlorid.....	.308-3.70	5-60
kino.....	7.39-11.09	30-180
nux vomica.....	.308-.924	5-15
opium.....	.185-.924	3-15
camphorated.....	1.84-7.39	30-120
squill.....	.308-1.23	5-20
strophanthus.....	.123-.616	2-10
valerian.....	.924-3.70	15-60
veratrum viride.....	.308-.924	5-15
Trional.....	.65-1.95	10-30
Wine, antimony.....	.308-3.70	5-60
colchicum root.....	.308-1.23	5-20
seed.....	1.23-3.70	20-60
ergot.....	3.70-14.79	60-240
ipacac.....	.616-3.70	10-60
Zinc bromid.....	.065-.194	1-3
iodid.....	.065-.194	1-3
sulphate.....	.016-.065	$\frac{1}{4}$ -1
valerianate.....	.032-.13	$\frac{1}{2}$ -2

FORMULARY

THE "few" formulas here given are of such combinations as the nurse employs in her daily work. They are for local use only.

Yellow Lotion or Yellow Wash:

Uses.—Stimulating application for wounds, ulcers, and skin affections. Especially used for syphilitic sores and ulcers.

Bichlorid of mercury 30 grains.
 Water 1½ ounces.
 Lime-water to make 1 pint.

Dissolve the bichlorid of mercury in the water, and then add sufficient lime-water to make 1 pint. This should be well shaken before using, each time.

Black Lotion or Black Wash:

Uses.—As a stimulating application for wounds, ulcers, and skin diseases.

Calomel 50 grains.
 Lime-water 1 pint.
 Mix and shake well before using.

White Lotion:

Uses.—In skin diseases, especially acne and scabies or itch.

Sulphurated potassa ½ ounce
 Zinc sulphate ½ "
 Water to make 1 pint.
 Mix and shake well.

Red Lotion, Red Wash:

Uses.—Stimulating and astringent lotion for weeping or wet wounds.

Zinc sulphate 32 grains.
 Compound tincture of lavender ½ ounce.
 Water to make 1 pint.
 Mix and shake well.

Evaporating Lotion:

Uses.—Principally for contusions, also for indolent ulcers.

Ammonium chlorid.....	1½ ounces.
Water.....	14 “
Alcohol to make.....	1 pint.

Mix in order given, and shake well.

Lotion of Aluminum Acetate:

Uses.—As an astringent lotion for ulcers and as an antiseptic wet dressing.

Alum.....	3 drams.
Lead acetate.....	5 “
Water.....	1 pint.

Dissolve each of the solid ingredients in 8 ounces of water, mix, allow to stand twenty-four hours, and filter.

Lead and Opium Lotion:

Uses.—As an astringent and anodyne application to bruises, sprains, and inflammations.

Lead acetate.....	2½ drams.
Water.....	1 pint.
Laudanum (tincture opium).....	5 drams.

Mix in order given and shake well.

Solution of Sodium Borate Compound (Dobell's Solution):

Uses.—As a mild antiseptic for the mouth and nose.

Sodium borate.....	2 drams.
Sodium bicarbonate.....	2 “
Water.....	8 ounces.
Glycerin.....	½ ounce.
Carbolic acid.....	24 minims.
Water to make.....	1 pint.

Mix in order given.

Solution Alum Compound:

Uses.—As an astringent gargle.

Alum.....	3 drams.
Boric acid.....	3 “
Potassium chlorate.....	1½ “
Water to make.....	1 pint.

Saline Solution, Strong:*Uses.*—To make normal saline solution.

Table salt..... 6 drams.

Water..... 1 pint.

Mix and sterilize.

Normal Saline Solution:Strong saline solution..... $\frac{1}{2}$ ounce.

Water to make..... 1 pint.

Boric Acid Solution (Saturated):

Boric acid..... 5 drams.

Water..... 1 pint.

Boric and Salicylic Acid Solution (Thiersch's Solution):*Uses.*—Mild antiseptic for washing mucous membrane cavities, as nose, mouth, and bladder.Boric acid..... $1\frac{1}{2}$ drams.

Salicylic acid..... 15 grains.

Water..... 1 pint.

Strong Potassium Permanganate Solution:

Potassium permanganate..... 1 ounce.

Water..... 1 pint.

Potassium Permanganate Solution (1:1000):

Strong solution (see above)..... 2 drams.

Water..... 1 pint.

Bichlorid of Mercury Solution (Strong):

Bichlorid of mercury..... 2 ounces.

Water..... 1 pint.

Bichlorid of Mercury Solution (1:1000):

Strong solution (see above)..... 1 dram.

Water..... 1 pint.

Solution Carbolic Acid (20 per cent. or 1:5):Carbolic acid..... $6\frac{1}{2}$ drams.

Water..... 1 pint.

Borosalicic Powder:*Uses.*—Useful for dressing the umbilical stump of newborn infants.

Acid salicylic..... 10 grains.

Acid boric..... 50 “

Starch powder..... 1 ounce.

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